OFFICIAL PUBLICATION OF THE PROCEEDINGS AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

SEPTEMBER 5, 1949
VOLUME 38, NO. 18

AMERICAN DYESTUFF REPORTER

DEVOTED TO TEXTILE CHEMISTRY • BLEACHING • DYEING • PRINTING • FINISHING

For bright bluish rubine shades on acetate or nylon...

ACETAMINE* Rubine 3B has good light fastness... very good fastness to both dry and wet crocking... hot moist pressing... good resistance to washing, dry cleaning and sublimation.

The blue shade of this direct dyeing acetate color recommends its use as a base for a wide range of wines, clarets, bordeaux and maroons.

"ACETAMINE" Rubine 3B produces speck-free prints by the usual printing methods. Suitable for dress goods, draperies, and other decorative fabrics. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington, 98, Del.

*REG. U. S. PAT. OFF.

Du Pont Dyestuffs

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exceptionally fast to light

Superlitefast

DIRECT DYES

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Features:

- ★ 150-300 hours light fastness
- ★ extremely level dyeing in all percentages
- ★ leaves acetate white
- ★ exceptional wash fastness at 160°F. *with soap and soda,* even without resin treatment
- ★ light fastness is not materially affected with curable resins.

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Chemical Company, Inc.
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pace-setter in precision dye-making

A Textile Utility
Product of
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Levelene*

- preparing
- dyeing
- finishing

An effective Leveling agent — Penetrant — Dispersant and active Stripping Catalyzer.

Particularly well suited in minute quantities as a retardant for vat dyeing — either in the pigment pad or reduced methods — as well as for vat stripping.

Another of the A.A.P. range of superior textile auxiliaries. For detailed information regarding your own particular requirements consult our nearest branch. A.A.P. technicians are always happy to be of service.

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KERANOL N K

gives **COTTONS AND RAYONS**

a very **DESIRABLE, SOFT, FULL HAND**

durable to **WASHING AND DRY-CLEANING**

Unaffected by pH variations in the finishing bath—compatible with Resins—very resistant to yellowing, even at excessively high temperatures. Write for our technical service bulletin #208-110.1

IT'S AN Arkansas PRODUCT!

CO., INC.

NEWARK, NEW JERSEY

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Fabrics need lubrication, too!

and "AVITONE" fiber softener does a thorough job

For quality cottons and synthetics, you won't find a better softening agent than Du Pont "Avitone."

"Avitone" gets right to work on the fiber, gives full softness and smoothness to your fabrics—makes them easier to work with. "Avitone"-treated fabric gives improved performance during high speed sewing operations—the needle slides easily between the fibers, minimizing cutting or breaking of yarns.

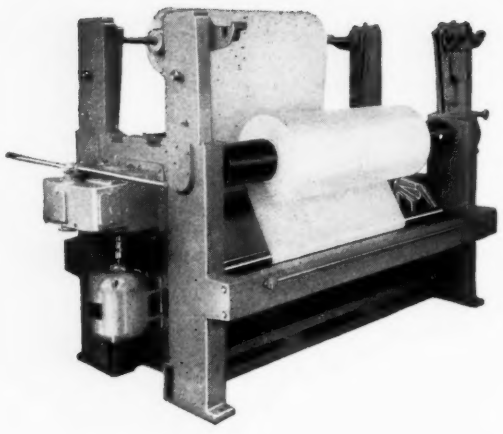
"Avitone" is easy to apply, stable in hard water. Its wetting action facilitates mechanical shrinking. With "Avitone" your whites stay white —do not turn yellow or become rancid on aging.

Increased production makes "Avitone" immediately available to you. For further information, check with Fine Chemicals Division, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del., Branch offices: Atlanta, Boston, Charlotte, Chicago, New York, Philadelphia, Providence, San Francisco.

AVITONE TRADE MARK *fiber softener*

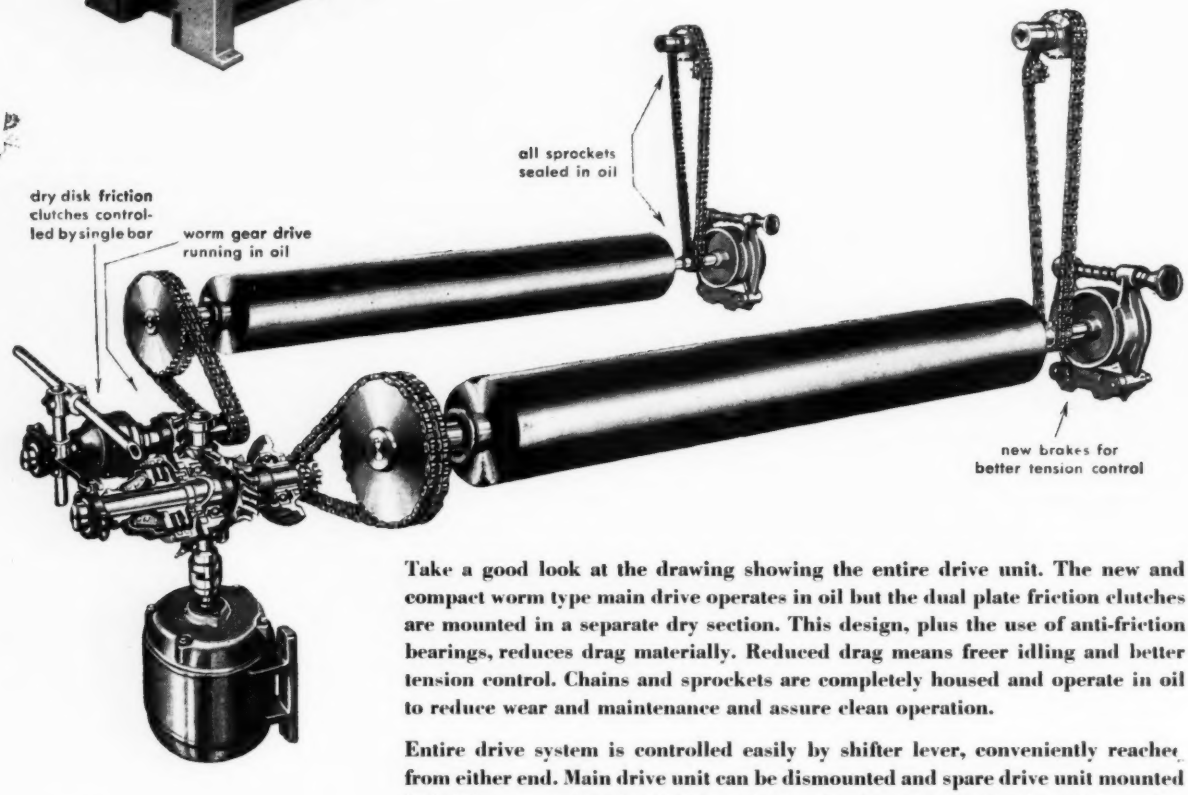
DU PONT REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING ...*THROUGH CHEMISTRY*



LOOK TWICE AT THIS *New* JIG

Van Vlaanderen has set an entirely new standard in jig performance with this machine. Better tension control, drag-free idling, easier and cleaner operation, capacity for larger cloth rolls and better production are all here, enabling you to produce better quality goods at lower costs.


all sprockets sealed in oil
dry disk friction clutches controlled by single bar
worm gear drive running in oil
new brakes for better tension control

Also

Van Vlaanderen builds a constant-speed, tensionless dyeing machine which is the standard of value where tensionless dyeing is important.

Take a good look at the drawing showing the entire drive unit. The new and compact worm type main drive operates in oil but the dual plate friction clutches are mounted in a separate dry section. This design, plus the use of anti-friction bearings, reduces drag materially. Reduced drag means freer idling and better tension control. Chains and sprockets are completely housed and operate in oil to reduce wear and maintenance and assure clean operation.

Entire drive system is controlled easily by shifter lever, conveniently reached from either end. Main drive unit can be dismounted and spare drive unit mounted in half hour—a valuable aid in keeping production at the peak where the number of machines in operation justify a spare drive unit.

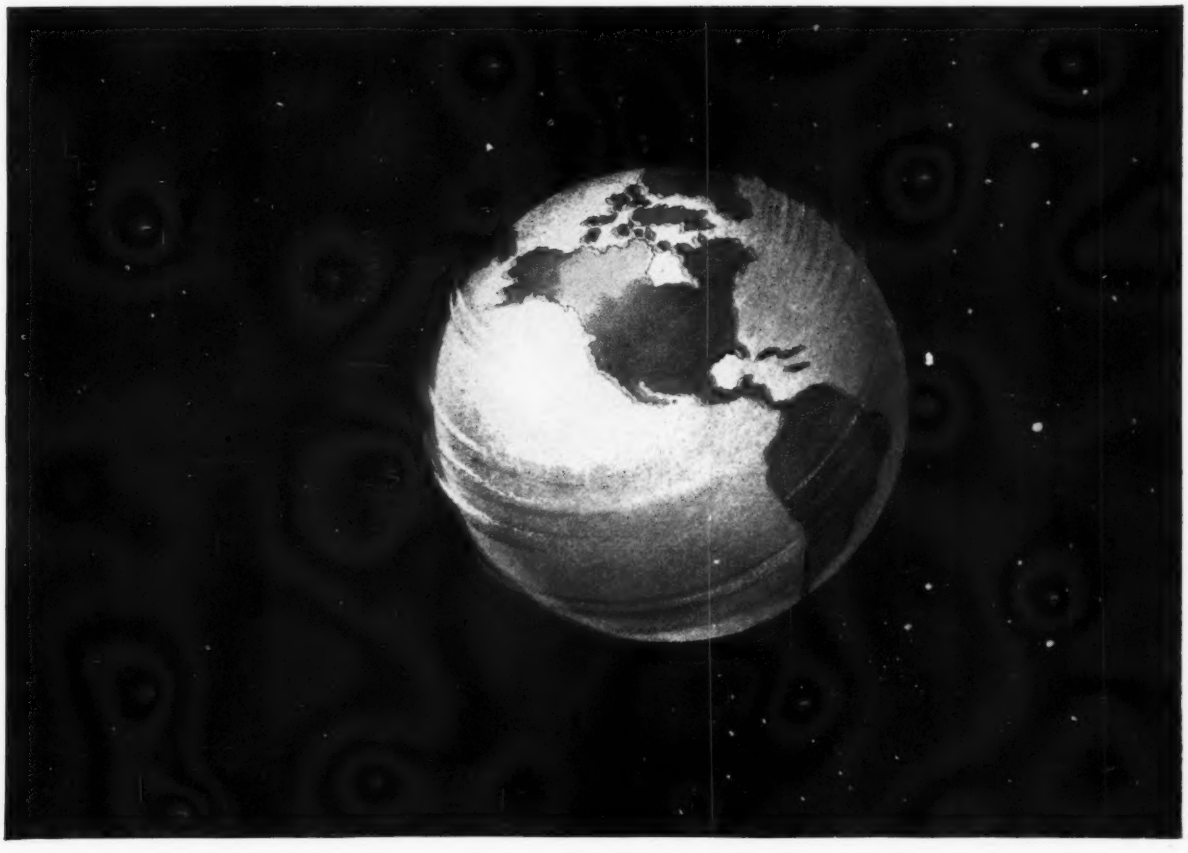
Other important features: heavy vibration-free cast iron side frames, stainless steel tank, 7 ¼″ rubber covered rolls, new overflow arranged sideways, guide rolls stainless steel. Oscillating type expander unit with stainless steel curved bars and immersed rolls. Guide rolls mounted on special stainless steel roller bearings. Better tension control with redesigned malleable iron brakes and tension indicator permit quick, accurate readings. Other type brakes if desired.

We have made arangements to show you this machine in actual plant operation.

VAN VLAANDEREN MACHINE COMPANY

370 Straight Street • Paterson 3, New Jersey

World's largest manufacturer of machines for processing modern fabrics



Speaking of CONTINUOUS OPERATION

New methods of continuous processing demand a coordination of materials, skill and equipment for successful operation.

Here more than ever you need a dependable de-sizing agent that will not only give you a uniformly fine finish, but help you to keep finishing troubles at a minimum.

To many men responsible for finishing and dyeing, that means *Diastafor brand de-sizing agent—Type L.*

Diastafor—Type L has the qualities that bring real flexibility and ease to de-sizing operations. You'll find Diastafor will give you exceptional results in continuous processing.

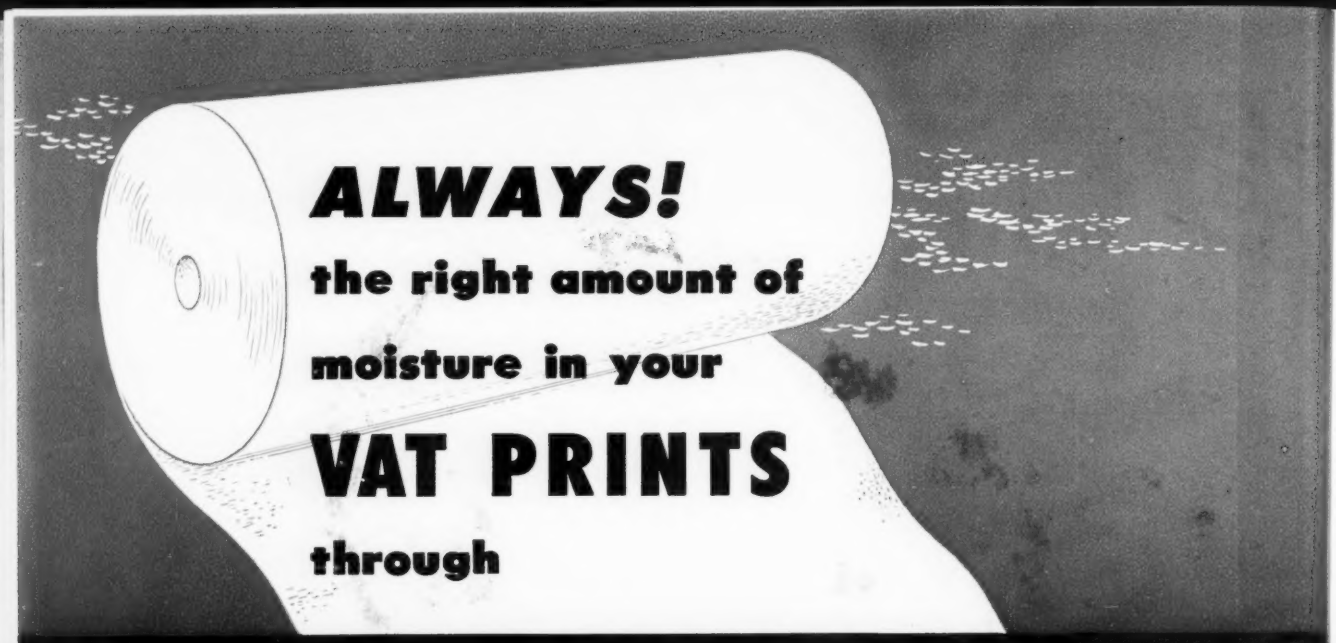
Diastafor can be used in an unusually wide range of temperatures, and in a wide pH range to meet all enzyme de-sizing requirements. It gives superb performance whether you are working with cottons, rayons or mixed goods.

Yard after yard and mile after mile, you get a good hand and a fine finish when you use Diastafor. Dyeing is even and unshaded—no streaks or blemishes. Diastafor is kind to your fabrics, too; there is never any impairment of tensile strength.

And (speaking of continuous operation!) Diastafor has been the leader in its field for more than 40 years. It has always been our aim to give you the best de-sizing agent your money can buy. For further information write Standard Brands Incorporated, *Diastafor Department*, 595 Madison Avenue, New York 22, New York.

DIASTAFOR

A TRADE MARK OF STANDARD BRANDS INCORPORATED



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the right amount of moisture in your

VAT PRINTS

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CORPOLIN®

HYGROSCOPIC AND PLASTICIZING AGENT

PROPERTIES . . .

CORPOLIN is a heavy non-volatile liquid—clear, colorless, odorless, free-flowing.

Resembles glycerin in feel and appearance.

A highly concentrated solution of organic compounds in water, containing 70% solids.

NON-TOXIC; NON-FLAMMABLE; no freezing point.

USES . . .

Attracts and retains the right amount of moisture in VAT PRINT PASTE. Replaces glycerin at ½ the cost, without change in formulation.

Introduces valuable economies through its power as a humectant.

Makes textile fabrics and paper flame-resistant.

Excellent for sizing, finishing and weighting.

Technical data sheet and samples forwarded on request.

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HEYDEN CHEMICAL CORPORATION

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ULTRAWET SK

YOU PAY NO MORE FOR THIS DEDUSTED BEAD

When dry mixing you probably like detergents in bead form because of their free-flowing properties and the improvement in appearance of your finished compound. You probably haven't liked their excessive dust. *Now* you can have a bead from our new spray tower that flows freely . . . mixes easily . . . looks well . . . and is *virtually dustless*. It's *improved* ULTRAWET SK bead.

This new Atlantic development, a result of extensive experience in the science of spray drying, is available to you at no extra cost. You pay no more for *this* dedusted bead. A note on your letterhead will bring a sample.

APPLICATIONS	ULTRAWETS					
	30E	30DS	35K	SK	DS	K
Form:	Liquid	Liquid	Liquid	Bead	Flake	Flake
Minimum % Solids:	30	30	35	35	85	85
Minimum % Active-Solids:	85	85	90			
EMULSION BREAKING	✓					
LIGHT-DUTY HOUSEHOLD DETERGENTS			✓	✓		
PENETRANT	✓	✓				
INDUSTRIAL DETERGENTS					✓	✓
HEAVY-DUTY HOUSEHOLD DETERGENTS			✓			✓
EMULSIFIER					✓	✓
WETTING AGENT	✓	✓				
CHARGE STOCK FOR SPRAY AND DRUM DRYING			✓			
DRY MIXING WITH ALKALIS				✓	✓	✓
LIQUID HOUSEHOLD DETERGENTS		✓				
COUPLING AND SOLUBILIZING	✓					

For samples, further information and quotations, communicate with

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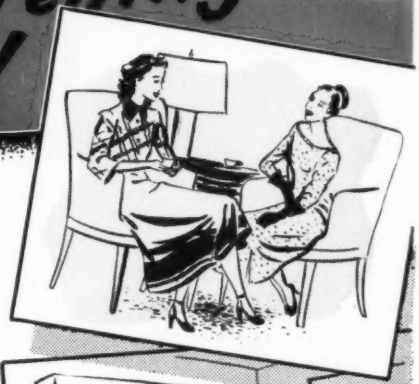
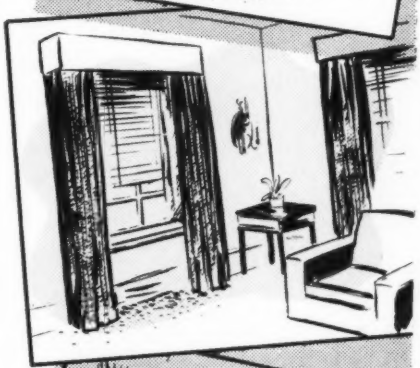
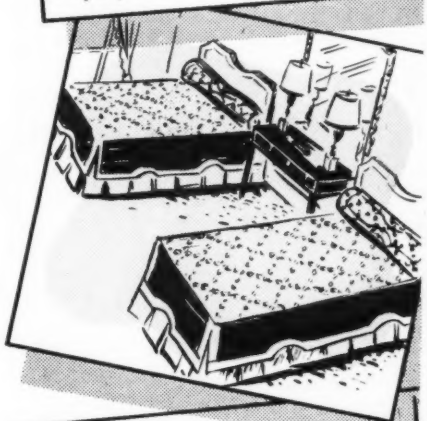
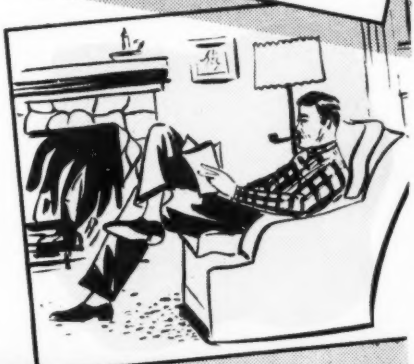
Why ONYXSAN* Softening HAS NO EQUAL!









PERMANENT . . . On cotton, acetate, rayon, bemberg, an Onyxsan finish is *permanent*. On other fibers the finish will show outstanding resistance to washing.

CATIONIC . . . All Onyxsan finishes are cationic. They become an integral part of the fiber, in contrast to other softeners having a mere surface effect.

WIDE RANGE . . . You can select your Onyxsan or combination of Onyxsans to give any type of hand you want, from the soft fluffiness of new fallen snow to a hard, waxy feel. Where nap is important, even on rough, nubby goods an Onyxsan will leave a fine, soft nap.

UNIFORM AND STABLE . . . Onyxsans are specific chemical compounds, capable of being held to uniform characteristics. They are stable and develop no odors, rancidity, mark-off or stiffness in treated goods. They are compatible with hard water, electrolytes and organic acids.

EASY TO USE . . . There are no operational changes when you adopt any of the Onyxsans. They are easily applied in the jig, quetsch, padder or dye beck.

ECONOMICAL . . . Only *small* quantities of any Onyxsan are required for treating practically any textile or for any effects.

ONYX TECHNICAL BULLETIN TX-1

gives the detailed story on every one of the Onyxsans—their characteristics, uses and advantages. Write for a copy, or for as many copies as you think you can use to advantage.

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In Canada: Onyx Oil & Chemical Co., Ltd., Montreal, Toronto, St. Johns, Que.
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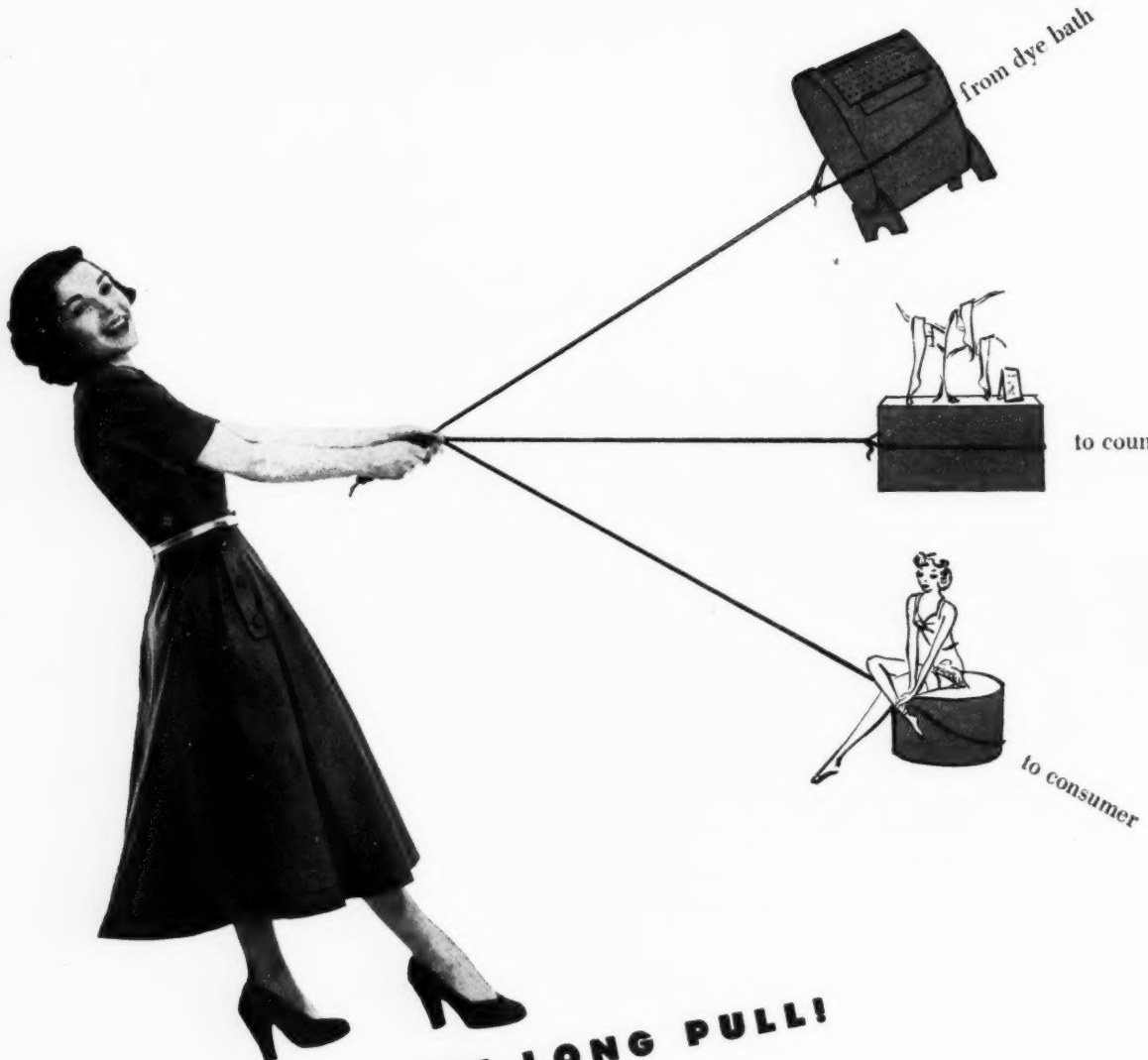
onyx CHEMICALS FOR DYEING · FINISHING · PRINTING



GOOD FOR THE LONG PULL!

. . . Fanco finishes seal in the beauty of fine knitting . . . protect it throughout its lifetime. Yes, no matter the denier you run, the hand you desire, the boarding system you use or the special properties that you want for your hosiery . . . Fanco finishes will give them to you accurately and continuously. Your Fanco fieldman will gladly prove this with a no-obligation, on-the-spot test.

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Philadelphia, Pa.
In the South,
Howard A. Virkler, Greensboro, N. C.

SOLVING FINISHING PROBLEMS SINCE 1904

HOW THIS PATTERN WAS PRINTED IN MEXICO

To interpret best the dashing character of this brilliant native print—*and to cut production costs*—Acabados Textiles Marvel S.A., prominent Mexican textile mill, used Aridye® Pigment Colors.

Here's how they did the job on spun rayon: The coral ground was dyed in the usual manner with a dischargeable direct color. Aridye Yellow FY2G, cut 1:5 with regular Aridye Clear containing 16 ounces per gallon of sulfoxylate, was used for the yellow discharge. Aridye Blue FC2G, cut 1:10 in a similar clear, was used for the blue discharge. Aniline black was used for the black. After printing the fabric was dried, aged, chromed, cured at 310° F, and washed.

Like Acabados Textiles Marvel, other progressive textile printers 'round the world are finding that Aridye Pigment Colors CUT SECONDS . . . SAVE MONEY!

An Interchemical technical representative will be glad to discuss the many ways in which they will be of benefit to *you*. For full details write to Interchemical Corporation, Textile Colors Division—Pioneers in Pigment Colors for Textiles—Box 357, Fair Lawn, N.J.

Aridye *Pigment Colors*

CHECK THESE ADVANTAGES

Colors as printed are final in shade • Sharpness of mark
Top Fastness to sunlight
Uniformity of shade • Fastness to washing
Bright colors • Ease of application • No impairment of hand
Can be used in combination with ordinary dyes

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INTERCHEM ACETATE

GREEN-BLUE ALF-40

Interchem® Acetate Green-Blue ALF-40 is a new fast-to-light color for dyeing acetate rayon and nylon. Even in delicate pastel shades (0.25% dyeings), this color has exceptional fastness to light.

Interchem Acetate Green-Blue ALF-40 is recommended for:

Producing both self shades and compound shades.

Use in combination with Yellow GLF-40 and Pink BLF-40 — both have similar fastness properties to Green-Blue ALF-40.

They are outstanding low-temperature dyeing colors giving excellent pile-on and positive control in dyeing of compound shades.

Interchem Acetate Green-Blue ALF-40 and other dyes of the LF-40 Series are recommended for dyeing fabrics for men's wear, high-quality women's wear, bathing suits, and other materials where fastness to light is important.

For complete technical information and samples write to: Interchemical Corporation — Textile Colors Division, Box 357, Fair Lawn, New Jersey.

Interchem Dyes
TRADE MARK

Announcing PARNOL

More than just a highly effective detergent—a surface-active agent of exceptional merit as well.

In the dyeing and finishing of textiles, PARNOL is already proving the value of its unique combination of exceptional wetting properties and high detergent characteristics. It is an anionic dodecyl-toluene sulfonate whose molecular structure maintains that hydrophilic-lipophilic balance so necessary for efficient, economical processing of materials.

PARNOL is a spray-dried, free-flowing, non-hygroscopic white powder with little or no odor, stable in acid or alkali solutions of percentages encountered in textile manufacturing. It produces exceptionally high and lasting foam in either hard or soft water.

As the typical analysis shows, PARNOL has an unusually high percentage of active matter. Its effectiveness, both as a wetting agent and as a detergent, is shown by the Draves and the Ross-Miles tests, given below. Its detergent powers in hard and soft water are further evidenced by reflectance measurements in Launderometer tests.

Full information and samples will be sent on request.

A TYPICAL ANALYSIS

Active Matter	41.25% (Dry basis)
Inorganic Salts (principally Na_2SO_4)	58.20% (Dry basis)
Unsulfonated Material	0.55% (Dry basis)
Moisture	1.70%
pH (1% solution)	7.50

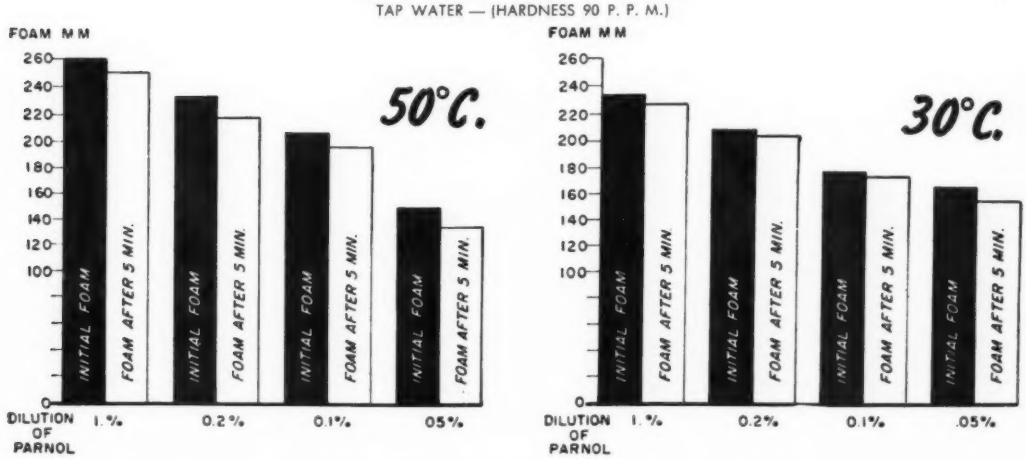
DRAVES WETTING TEST

TAP WATER — (HARDNESS 90 P. P. M.)

DILUTION	TIME
0.25%	6 sec.
0.20%	10 sec.
0.15%	12 sec.
0.10%	15 sec.

ROSS-MILES TEST

TAP WATER — (HARDNESS 90 P. P. M.)



For full information on PARNOL and sample, send the coupon below.

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☐ I would like test sample for use in.....

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Careful Buyers of Caustic Soda and Chlorine

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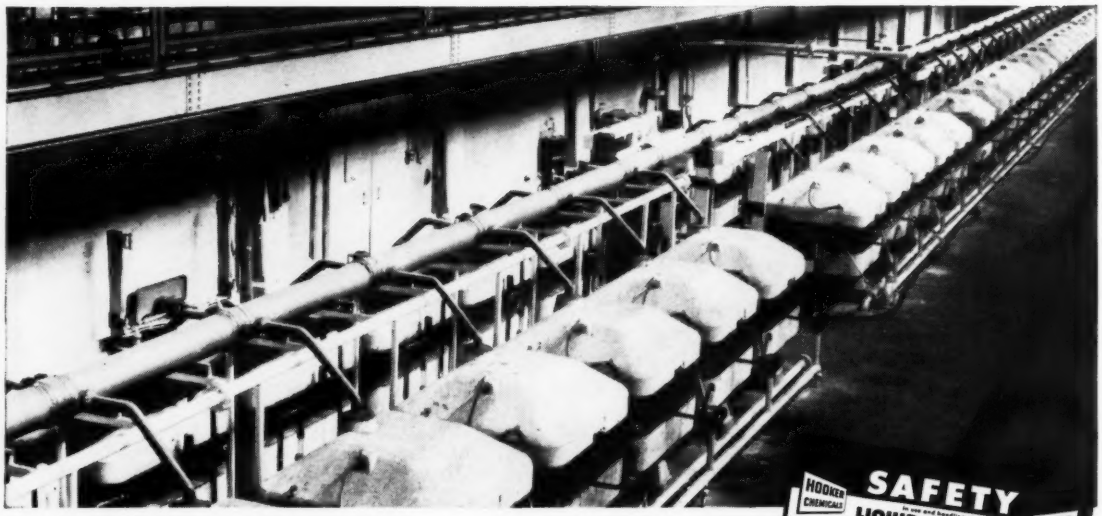

In the Hooker Electrochemical Company you have a dependable source for caustic soda and chlorine of high quality and constant uniformity. This is testified by the increasing number of users who year after year continue to secure their requirements from Hooker.

They have learned through experience that they can rely on these products of the famous Hooker "S" Cell. Produced under watchful control, each shipment is of the same uniform high quality. Through careful inspection and care of containers it reaches you in the same condition it leaves our plants.

Hooker Caustic Soda is available in solid, flake, or liquid form. Liquid is available in 50%, 73% and special grade solutions.

Hooker Liquid Chlorine, of standard market quality, is shipped in cylinders, multi-unit cars and tank cars.

For uniform processing from uniform Liquid Chlorine and Caustic Soda, specify Hooker.

Users of Chlorine will want a copy of the Hooker Wall Chart, "Recommendations for Safety in the Use and Handling of Chlorine in Cylinders and Ton Containers". Printed in large readable type on linen backed paper, it is ideal for mounting wherever you use or store chlorine.

From the Salt of the Earth

HOOKER ELECTROCHEMICAL COMPANY

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KELTEX

TOPS for TIES

printed with acid, direct and acetate colors on acetate, viscose, wool and pure silk tie goods

● Clean-edged printing . . . rich and brilliant colors . . . patterns that are sharp and clear – these are the results you aim for when printing tie materials. And these are the qualities of which you are sure when using Keltex as your print paste thickener.

Keltex is the modern algin thickening agent that gives you exact and uniform paste viscosity; assures maximum color penetration, and brings out true, even color values.

Equally effective in machine or screen printing, Keltex can be used on acetate, viscose, wool and pure silk tie goods. It gives excellent results with direct, acetate and acid dyes or with discharge.

Because it is entirely free of grit or cellulose, Keltex requires no straining or filtering to insure against damage to rollers and screens. It is readily soluble in cold water; needs no cooking or special treatment, and is easily washed out to give a soft and pliable hand.

Keltex is consistently uniform because it is a definite chemical compound, processed to rigid physical and chemical specifications.

For suggestions and information on how Keltex can be profitably applied to your particular requirements, write to our nearest regional office.

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for Cottons, Rayons, Mixed Goods

An amylolytic enzyme preparation particularly adapted for faster, more economical de-sizing in any equipment. Its wide range of operation temperatures permits highest speed with most economical production. Its starch-solubilizing action is doubled with each 18° rise in temperature between 120° and 200° F.

higher quality work

SERIZYME®

for Acetates and Acetate-Rayon Mixtures

A proteolytic enzyme product that safeguards against streaky dyeing . . . Produces a finer hand . . . Assures uniform quality . . . Clearer cross dyes. SERIZYME liquefies protein and albuminous sizes and removes them completely.

Our technicians are available to visit your plant on request . . . Write for technical booklet.

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no more hand-me-downs

for stainless sheet and strip

Stainless sheet and strip production is coming of age—no longer made on the hand-me-downs of carbon steel production, thanks to modern advances in strip mill practice. CRUCIBLE, drawing on this progress and on generations of *specialty* experience, has carried stainless development even further by building the world's first complete mill designed *specifically* for hot and cold rolling of stainless steels. In this $18,000,000 project, every building, every piece of equipment, has been built to incorporate the *best* of accepted modern practice, PLUS exclusive features designed by CRUCIBLE's industry-famous technical staff.

Here stainless sheet and strip is produced in widths from ½" to 50" inclusive, in all gauges, grades and finishes. This new and important contribution to the production of stainless steel is vital news to every processor of stainless steel products. For now CRUCIBLE, one of the pioneers in stainless steels, rounds out an integrated program of stainless in all its forms—sheets, strip, plates, bars, wire, forgings, castings, and tubing (manufactured by the new subsidiary, Trent Tube Co.) To this program CRUCIBLE has applied its *specialty product* methods of quality control, methods that have given CRUCIBLE leadership in special purpose steels for half a century. Data sheets for all grades are yours for the asking. Your inquiries will be welcomed.

CRUCIBLE STEEL COMPANY OF AMERICA
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Branches, Warehouses and Distributors in Principal Cities

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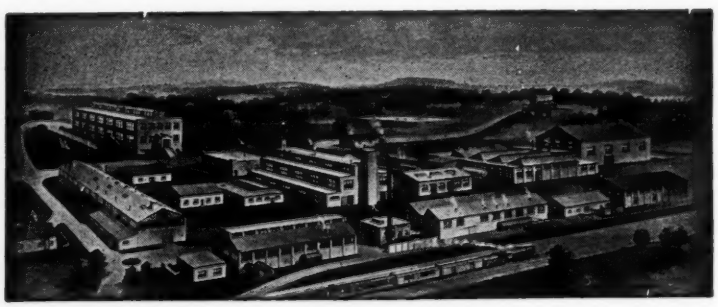

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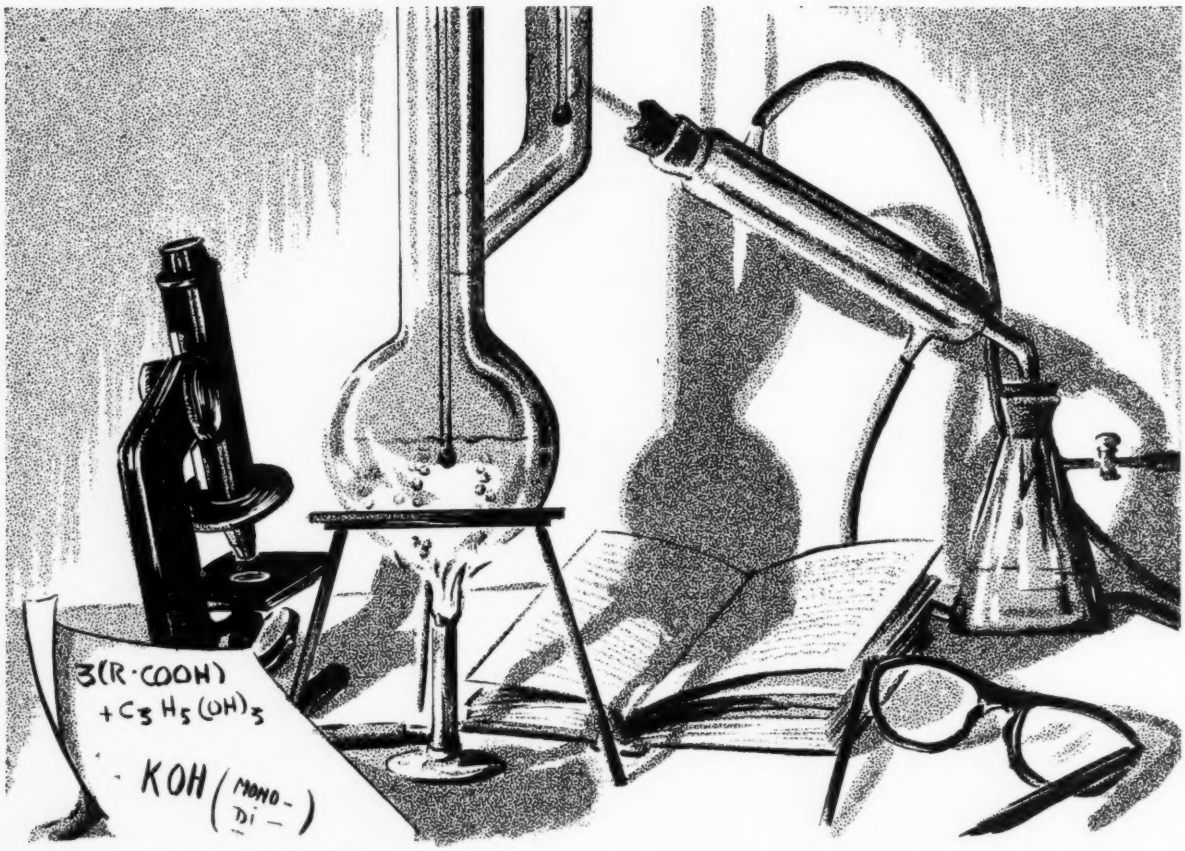

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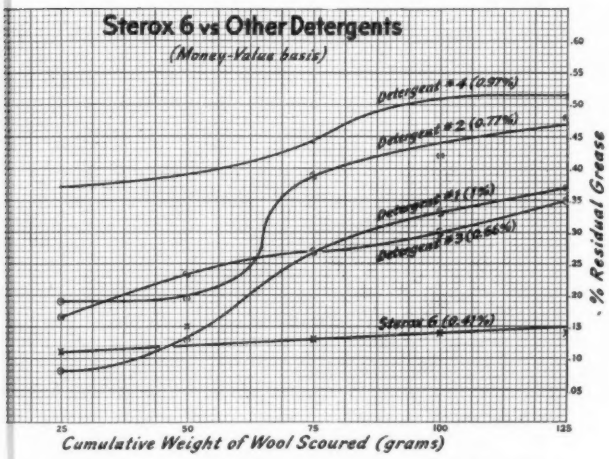

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Contents

Contents of previous issues can be found by consulting the Industrial Arts Index and the Engineering Index, Inc. at your library

• Special Articles

Rapid Photomicrography 635
Charles Maresh and R. R. Krammes
Available: Controlled Carpet Beetle Larvae..... 636
William Anderson
Some Defects Arising in the Finishing of Woolen and Worsted Fabrics..... 637
C. S. Whewell
The Dyeing of Wool-Nylon Blends..... 661
G. T. Hug

• Departments

Abstracts 641
Trade Notes—New Products..... 651
Patent Digest 659
Paul Wengraf
Book Reviews 660

• Proceedings of the American Association of Textile Chemists and Colorists

Report of the Nominating Committee.....P644
Preliminary Program for Atlantic City Convention..P645
Rhode Island Section—
Current Trends in Operating Rubber Covered Rolls in Textile Finishing.....P646
Asa F. Fisk
Old Reporters Wanted.....P648
Correspondence on Monograph No. 1.....P648
September Meeting, Northern N. E. Section.....P648
Southeastern Section Activities.....P648
Employment Register P648
Calendar P649
New York Section to Meet on September 23rd....P649
Western N.E. Section to Meet September 23rd.....P649
Rain Tester Blotting Paper.....P649
Lapel Buttons for A.A.T.C.C. Members.....P649
Atlantic City Convention.....P650

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VOLUME 38 SEPTEMBER 5, 1949 NUMBER 18

RAPID PHOTOMICROGRAPHY

CHARLES MARESH and R. R. KRAMMES
American Cyanamid Company, Calco Chemical Division, Bound Brook, N. J.

IN textile dyeing and finishing it is often desirable to record the microscopical observations *(1)* which are made of the progress of these processes. One photomicrograph is the equivalent of many words of description. Where color is involved, the sample may be photographed economically on 35 mm. color film. Where color is absent or of secondary importance, black and white photography is a little less time consuming. There are occasions, however, where a word description of a microscopical observation has to suffice simply because of insufficient time to prepare a black and white photograph by the conventional methods. In this laboratory various means have been used to speed the preparation of a finished print, such as printing by enlargement from a negative in the wet state and by the use of various devices for hastening the washing and drying processes. Recently the time required for the preparation of finished photomicrographs was further reduced by the application of the one-step photographic process developed by E. H. Land *(2)*. By the use of this process it is possible to photographically record economically in approximately one minute. Film for this one-step process is made by the Polaroid Corporation and must be used in a camera specifically designed for its use.

The photomicrographs shown in Figures 1 and 2 illustrate the application of this type of so-called rapid photomicrography. Figure 1 shows a cross section of wool fiber taken from a sample of wool fabric dyed with Calcocid Wool Blue Conc. by the high temperature dyeing technique *(3)*. The wool fiber was cross sectioned using the Calco modified Hardy technique *(4)* and photomicrographed by the one-step photographic process, all of which took approximately four minutes. Figure 2 shows fiber which was quickly teased from dark portions of a green dyed wool-rayon mixed fabric which showed undesirable dark streaks. The dark fiber is wool which has apparently been chemically damaged prior to dyeing. The damaged portions have absorbed the green dye more rapidly than the normal undamaged portions of the wool, giving rise to the dark streaks. Within a few minutes in both cases, a record of the progress of the respective dyeings was in the hands of the dyer.

For photomicrographic purposes the camera with its lens is mounted on the stand of a laboratory enlarger as shown in Figure 3. Use of the camera in this manner without the removal of the lens makes the camera readily usable for conventional macro photography when desired. The initial centering of the camera is carried out by opening up the back of the camera as shown in Figure 4 and viewing the object on a ground glass plate placed in the film position. Thereafter, provided the lamp or microscope has not been moved, it is necessary only to adjust the camera over the microscope so that the eye point of the microscope lies in the center of the front surface of the camera lens. After the desired field has been chosen with the camera swung out of position, focusing is carried out by placing a telescope over the eyepiece. The telescope should contain a grating upon which a distant object (i.e., 100 ft.) has been focused. When this telescope is placed over the microscope eyepiece, the

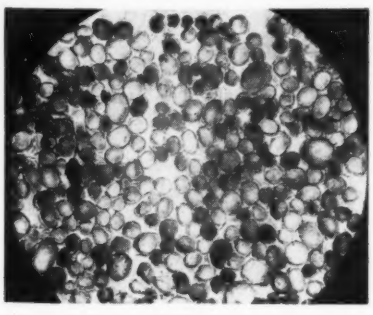

Figure 1
Cross section of wool dyed with Calcocid Wool Blue Conc.

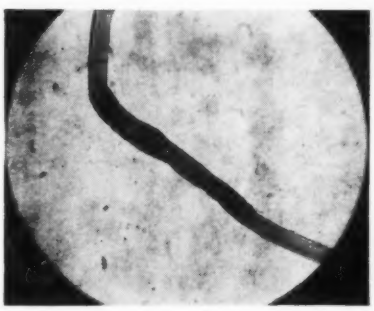

Figure 2
Damaged wool fiber removed from dyed fabric with undesirable streaks showing heavily dyed and normal dyed portions.

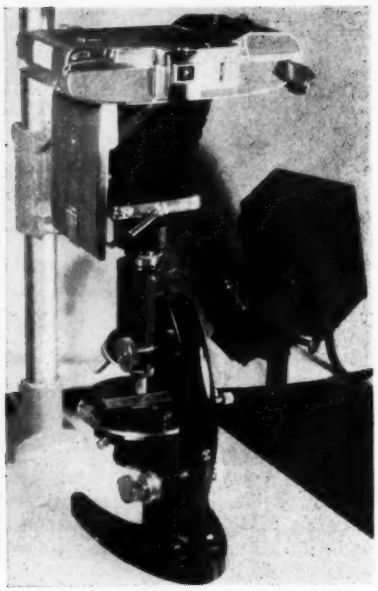

Figure 3
Set up for "Rapid Photomicrography".

microscope will be focused at infinity. The camera with its lens set at infinity focus is then swung over the microscope so that the eye point of the ocular lies in the center of the front surface of the camera lens. If used in a lighted room, a light tight adapter must be used between the microscope ocular and camera lens.

Using a 6 volt ribbon filament lamp in a Bausch and Lomb microscope illuminator system and 10 or 20X objectives with a 10X ocular, an exposure of one second with wide open camera lens was used for the photomicrographs shown in Figures 1 and 2. The exposure may be determined by simple trial and error, particularly since the processing is so rapid. One or two trials will give the most suitable exposure. The film has a film rating of 64 Weston with tungsten light which is equivalent to Super XX or Superpan Press film.

A barrier-layer type of photocell exposure meter may be used for establishing the correct exposure. In this laboratory light readings, using a barrier selenium photocell with a Leeds and Northrup type R galvanometer, are obtained through a ground glass plate placed over a 95 mm. extension tube which is placed over the microscope ocular with the camera swung out of position. The ratio of the light intensity reading at this point to that found at the film position in the camera was 4:1. By correlation with the proper exposure times, either of these measurements can be used to determine the exposure. It is obvious that the measurement at the film position can only be obtained if the camera is unloaded and, therefore, is less useful than the other reading. Whether the exposure is determined by trial and error or by light meter methods, the proper exposure for a particular set-up once determined will serve for all subsequent photomicrography (provided the lamp to microscope distance, lamp intensity, lamp, microscope, camera lens and iris characteristics are not changed). The type of subject must also be similar, but some latitude is allowable and experience will soon tell whether satisfactory results are being obtained.

The Type 40 film now available, which is orthochromatic, produces sepia toned prints which appear to have satisfactory permanence. Exposure of the prints for four hours in the Fade-Ometer produced some yellowing which disappeared almost completely upon storage in the dark. Exposure to noonday June sunlight for two hours also produced considerable yellowing which likewise disappeared upon dark storage. Washing of the prints eliminated the yellowing produced by light exposure; however, this is unnecessary since normal storage of the prints has not shown any yellowing.

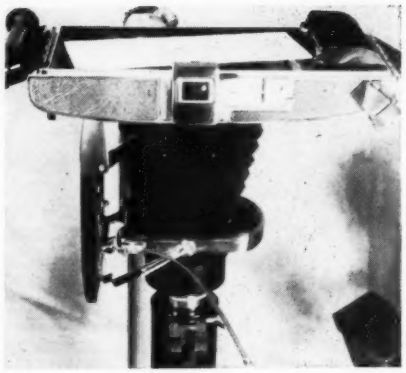

Figure 4
Back of camera opened and ground glass inserted at film position for initial centering.

Due to the nature of the process the negative is not suitable for preparing additional prints if desired and additional prints must be made from the original print by the orthodox copying technique.

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AVAILABLE: CONTROLLED CARPET BEETLE LARVAE

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PAST experience in our laboratories has indicated that variations in test results in the evaluation of moth repellents and fabrics which have been treated to render them moth repellent, are due to the use in many instances, of larvae of dubious age and breed. Inasmuch as this condition was encountered by our laboratories, especially in those instances when larvae were purchased from commercial breeders, a survey of breeding conditions and methods was launched.

It was established that the activity of the larvae was dependent on their age to such an extent that old (over 5 months) larvae were so inactive that borderline samples were found to meet the requirements of a satisfactorily treated sample. When the same material was tested with 5-month old larvae it did not meet the requirements of a satisfactory sample. It was also found that purportedly 5-month old larvae (commercial bred) developed into the purpae stage during the incubation test period, rendering the test useless and necessitating re-running the test, which resulted in loss of valuable time. Variable breeding conditions apparently rendered some of the larvae more resistant to various repellents and, in still other instances, less resistant to these repellent compounds. All of these factors contributed largely to the variable test results obtained between laboratories in the evaluation of insect pest repellents and fabrics or materials treated with repellent compounds.

In an attempt to standardize test results and eliminate the aforementioned variables, the United States Testing Company has developed their facilities for breeding carpet beetle larvae to such an extent that they are in a position to offer to the technical public, larvae which are certified by the company as being 5 months old and meeting all of the requirements of the Specifications of the American Association of Textile Chemists and Colorists.

SOME DEFECTS ARISING IN THE FINISHING OF WOOLEN AND WORSTED FABRICS*

C. S. WHEWELL

Introduction

THE object of this paper is to give an account of some of the more common defects which arise during the finishing of wool cloths. New machinery and new chemicals often minimize the seriousness of faults, and facilitate their correction, but damages are best prevented by employing skilled and conscientious operatives. Recent developments in the science and technology of finishing, far from decreasing the importance of the craftsman finisher, have placed increasing responsibilities upon him, for he must now understand the principles of an increasing number of widely differing techniques, and must be highly skilled in the art of cloth manipulation.

In general, the number of defective pieces can be greatly reduced by giving more attention to the control of finishing processes and by ensuring that all parts of the factory are kept clean and in good condition. Accurate systems of recording and bookkeeping will help in the tracing of defects which do occur, and will therefore tend to prevent their reappearance. Finally, close co-operation between spinner, manufacturer, and finisher is the best way of keeping the number of defective pieces to a minimum. These various aspects of the work of a finishing plant are illustrated by the following discussion of some of the more common faults which occur.

Preliminary Processes

Possible defects arising in the perching and mending room are few, although considerable damage may result from bad storage conditions. Attack by mice and rats, mildew, damage by rough treatment of the cloth, displacement of threads by the use of unsuitable mending needles, and breakages of threads by unskilled workers or by careless use of burling irons are nevertheless the causes of several minor faults.

Setting Processes

The most common operation for setting cloth is crabbing, which consists in winding the cloth on a roller which is rotating in boiling water. By this means the cloth is set and should not distort when subsequently scoured or dyed. Unless the work is carefully done many defects might arise. The effectiveness of the process is governed by the tension at which the cloth is wound on the roller, the temperature and time of treatment, and the composition of the crabbing liquor, and it is essential that each of these should be accurately controlled. The tension should be uniform but not too great, or the handle of the cloth will be papery; the temperature of setting should be maintained constant; and the pH of the liquor should be maintained *(1)* at about 7. The most common faults are as follows—

(1) Inadequate Setting—This often arises from setting at too low a temperature. Cloths of crossbred quality and cloths to be dyed should be set at the boil, although occasionally this is not possible if the dyes on effect threads, etc., are not fast to boiling. In these cases cooperation between manufacturer and finisher can be effective in choosing dyes which will withstand crabbing. Poor setting may be caused by the crabbing liquor becoming too acid, and since it is advisable to set at pH 7, all efforts should be made to keep the pH near this value. The use of borax solutions has been recommended, but this should not be necessary, although additions of synthetic detergents are occasionally useful. To obtain the best results the tension on the cloth should be sufficient to maintain the correct relation of the warp and weft threads to one another.

(2) Damaged and Weak Cloth—Damage may manifest itself as either low tensile strength or bad color and handle. Weak cloth may arise from the use of strongly alkaline solutions for crabbing *(2)*, and careful check should be made to prevent an increase in alkalinity during processing. Similarly, addition of reagents such as borax should be made with care. Use of alkaline solutions and crabbing for an excessively long time will give the cloth a bad color and a poor handle. It has been suggested that addition of compounds such as Melioran F6 (Hexoran Co.) to the crabbing liquor helps to preserve the color of the cloth.

(3) Color Bleeding—This fault may be particularly difficult to deal with, but it can be prevented by co-operation between the manufacturer and finisher. When it is known that the dyes used are liable to bleed, more careful control of pH should be exercised and the temperature of crabbing should be reduced. Setting would then be carried out at the highest temperature possible without causing bleeding.

(4) Uneven Treatment—This may show itself by local distortions after boiling, but more frequently the defect is not evident until the cloth is dyed, when the lists dye differently from the body of the cloth or the piece alters in shade from the head-end to the tail-end. Listing may arise from bad winding-on, and every care should be taken with this operation. The tension should be carefully controlled to avoid the cloth being treated more severely at the lists than in other places, due to greater accessibility to the liquor at the edges. The use of a reasonable length of wrapper at each end of the piece will reduce this defect.

Ending, i.e., the production of differences in shade between the two ends of the cloth, is minimized by the use of crabbing rollers of comparatively large diameter, and by crabbing the cloth twice—in the first treatment the head-end of the cloth is wound on first, while in the second the tail-end is placed first. Uneven results may arise from uneven heating of the tank and from uneven wetting of the cloth.

* Presented at meeting of Huddersfield and Scottish Sections, Society of Dyers and Colourists, March 15, 1948. Reprinted from their "Journal", January, 1949.

These can be avoided by good design of heating coils and by addition of wetting agents or synthetic detergents to the crabbing liquors.

(5) Creases—These are easily avoided by careful work, but it is important to remember that when a fabric is crabbed in a creased condition, the creases are permanently inserted in the cloth. This must be considered also in building up the roll of cloth, for unless the roll is carefully formed there is considerable risk of permanently embossing the edge of one layer of cloth on the next.

(6) Stains—Several types of staining are possible and many of these are discussed in connection with scouring, but metal staining due to the deposition of sulfides can be particularly troublesome. Since the setting operation is carried out at the boil, the disulfide links in the wool are broken. Some of these broken links recombine with other groups in the wool (amino groups in particular) to form the new cross-links which are responsible for the cloth being permanently set *(2)* but others are split differently, hydrogen sulfide and sulfur being formed. Both these substances are capable of reacting with metals, and produce dark-colored sulfides which stain the cloth. This is particularly marked if the crabbing roller is not covered with an adequate length of cotton wrapper to form a protection for the cloth to be treated.

Scouring

The main object of scouring is to remove the dirt and oil present in greasy wool cloths with the minimum adverse modification of the material. Usually this is carried out by treating the goods in aqueous solutions of soap and sodium carbonate, although there is an increasing use of auxiliaries and synthetic detergents. The precise procedure adopted is determined by the type of cloth, but in practically all fabrics the removal of dirt is accompanied by shrinkage both warp- and weft-ways, and while this is desirable in some suitings and cloths which are to be milled, it should be carefully controlled when finishing dress goods. Good scouring is the basis of good finshing, and largely determines the success of subsequent processing. During the scouring of all types of cloth it is essential to keep watch on changes in the appearance of the cloth and to maintain the material in a condition to respond to subsequent finishing operations. Most of the defects produced during scouring may be avoided by careful work, as is evident from consideration of some of the more common defects listed below.

(1) Oil Stains—These may arise from a variety of causes but most likely from faulty oiling of machines and shafting. If the stain is oil only, spotting with carbon tetrachloride, trichloroethylene, Sextol (Howards), or Astol A (ICI) and subsequent rescouring either of the whole piece or of the affected part by hand will be sufficient; but stains on cloth often consist partly of deposits of metallic compounds carried in suspension by the oil and will therefore be completely removed only by the additional use of an acid such as oxalic acid or of potassium cyanide (to remove copper). Stain removal must be thorough, for although a slight stain may be almost unnoticed in the scoured piece, the fault may reappear if the cloth is subsequently dyed, as the affected portion may have a modified affinity.

(2) Dirty Pieces—Such cloths have a dull appearance and poor handle, and often smell of oil and soap. They would eventually develop an objectionable odor owing to the oil or soap becoming rancid, and trouble would arise in subsequent dyeing, as the oils and acid soaps act as resists. Most of the unlevel results obtained in dyeing are due to inadequate preparation of the cloth. Pieces which contain oil after being scoured should be reprocessed with the addition of solvents to the usual scouring liquors. Although the commission finisher has to remove the oil from pieces which are delivered to him, and consequently must adjust scouring conditions to meet the various difficulties which arise, where there is close cooperation between finisher and manufacturer most of the difficulties connected with the removal of oil may be solved by suitable choice of oil. Thus, if low-grade oleines are to be used for oiling woolens, additions of mono- or diglycerides should be made to render the former easily removable by the usual scouring operations. Similarly, it is possible to use mineral oils for oiling both woolens and worsteds provided they are blended with the appropriate amounts of mono- or diglycerides *(3)*, or oleyl alcohol *(4)*. Much of this work on facilitating the removal of oils from wool has been encouraged by the present shortage of animal fats, and a great deal of progress has been made towards the finisher's ideal of a wool oil, viz. an oil which will facilitate spinning but which will be removed simply by treatment of the cloth with cold water.[1] It should be noted that scouring with neutral solutions of synthetic detergents is more effective *(5)* in removing low-grade oleines, i.e. oleines containing large proportions of mineral oil, than is scouring with the usual mixtures of soap and alkali.

Dirty fabrics may contain size which has been applied to the warp threads, but this is generally removed by rescouring at a slightly higher temperature.

Soap left on pieces after incomplete washing-off will cause them to smell and will give rise subsequently to unlevel dyeing. Addition of a little ammonia to the washing-off liquors will facilitate the removal of soap, and whenever possible, washing-off should be carried out with warm water. Most dyes will withstand such treatment, and if washing-off is commenced at about 50°C. by gradually adding warm water so that the emulsion is not cracked and then washing until the soap and dirt are eliminated, there should be little difficulty in subsequent operations. The temperature of the liquor should be gradually reduced, and finally the piece should be run for at least five minutes in cold water before being removed from the washing machine. The presence of calcium or magnesium soaps gives rise to many unlevel dyeings, and all efforts should be made to prevent their formation. Thus, hard water should be softened. In some cases, however, lime is present in the wool, and the calcium soaps are formed by interaction with the sodium soaps used to scour the cloth. Addition of Calgon (Albright & Wilson) during washing-off is extremely useful here, although it must be acknowledged that this procedure is not effective in every instance. In some skin wools and wools scoured overseas the lime soap seems to be particularly tenaciously held. It has probably been formed during scouring of the raw wool, and subsequent drying and storage have made it very difficult to remove. An alternative procedure when calcium soap defects are prevalent is to scour with a synthetic detergent instead of soap. This is particularly useful when scouring raw wool or worsted yarn or cloth. With woolens it must be remembered that any alkali in the scouring liquor will react with the oleine and will form sodium soaps which may result in the formation of calcium or magnesium soaps. A preliminary rinse of the material in dilute hydrochloric acid may be useful in dealing with lime.

(3) Loss of Handle, Yellowing, and Color Bleeding—These defects are generally caused by using high temperatures and high alkali concentrations during scouring. If there is any doubt regarding the fastness of dyes, it is advisable to scour a small trial pattern before dealing with a batch of pieces; and although the need for fast-to-scouring dyes cannot be too greatly emphasized, when the finisher is confronted with a fabric dyed with inferior dyes, it is necessary to obtain the maximum detergent action at low temperatures and in solutions containing very little alkali. Synthetic detergents functioning in acid or neutral solutions are extremely useful in this connection, and the possibility of using a technique involving a succession of rapid scours at low temperatures should not be overlooked.

(4) Washer Marks—These are caused by the cloth running continuously in the same folds. Some cloths are more liable to show this defect than others on account

of their particular construction, but in most cases it may be overcome by opening the pieces during scouring or by cross-drafting. If these devices fail, the piece should be scoured in an open-width machine. Bagging of pieces, i.e. sewing the lists of the fabric together, also tends to reduce washer marks, but this operation should be carefully done, and rigging the greasy piece on a rigging machine kept for the purpose is an advantage. Bagging serves also to protect the surface of the cloth from damage.

(5) Cockled Pieces—The distortion of design and structure resulting in cockles in scoured pieces is due to inadequate setting. The defective piece should be tentered and recrabbed, but in most cases it is difficult to rectify this fault.

(6) Excessive Shrinking—When the character of a fabric is spoiled by excessive shrinking, it is necessary to reduce the time and severity of the scouring, or to scour at open width. Synthetic detergents are useful in this connection, as many of them have considerable cleansing action but cause less felting than does soap.

(7) Faults caused by allowing Wet Pieces to lie about—Two main defects arise from leaving wet pieces, namely, modification of dye affinity and staining. It has been found that when the wet piece is alkaline, the alkali migrates on standing, so that, although the total alkali content might be quite low, selected parts of the fabric, such as folds and creases, acquire a high alkalinity. As the piece dries out, there is further concentration of alkali, which permanently damages the wool fibers by breaking the disulfide links. The dyeing properties of the material are thereby altered, the damaged portion showing a greater affinity for dyes, and when the whole piece is dyed, unlevel results are obtained. On white fabrics alkali migration may result in certain parts of the cloth being stained yellow.

Another cause of modified dye affinity and staining is "mildew", a term which is popularly employed to describe the growth of moulds and bacteria on cloth. When the cloth contains only slightly more than its usual moisture content, moulds and vegetable growths will flourish, especially those of the genera *Penicillium*, which are green, and *Aspergillus*, which are usually black; but when the cloth is really wet, bacteria attack the fibers resulting in degradation to cortical cells. Moulds and bacteria produce variously colored stains, most of which are impossible to remove, and the damage which generally accompanies the staining gives the affected part a modified affinity for wool dyes. Bacterial degradation occurs less easily in acid media than in alkaline, and hence any pieces which are particularly susceptible to attack should be made slightly acid after scouring by adding a little acetic acid to the final washing-off liquors. This technique may be adopted if it is required for any special reason to leave damp pieces overnight or over the week-end.

(8) Curled Lists—This is really a structural fault, and should be rectified by correct designing of the cloth, but if a fabric which shows a tendency to curling has to be finished, the lists should be carefully sewn together before scouring.

(9) Holes in Pieces—Most holes can be avoided by careful work, as they are invariably caused by foreign bodies getting into the machines; nails, pieces of plaster from the roof of the shed, and pieces of wood are examples of common offenders. Holes may arise also through running the machine with too much weight on the top roller. Initially this produces chafing, but if the cloth is lightly built, holes may develop. An uneven lower roller in the machine also is a contributory factor.

(10) Stains—Wood stains generally occur when parts of the scouring machine or other equipment begin to rot. Once they are formed it is practically impossible to remove them, and, consequently, every attempt should be made to reduce the possibility of their occurrence. Rollers should be frequently examined, and skimmed up when necessary. Rubber rollers, are of course an advantage in this connection, as the possibility of staining is very much reduced. Any localized rotting should be attended to at once. Alkali, especially if concentrated, in contact with wood is liable to give rise to wood stains.

Stains may arise from several other causes. The use of indelible pencils for marking purposes should not be allowed, as small fragments of color which are detached when the pencil is sharpened are liable to stain the pieces. Similarly it is not desirable to have burl-dyeing machines near the scouring machines, as the dye is not easily kept out of contact with other fabrics being processed. Stains often arise from the deposition of sud on the cloth. This accumulates on the shafts of the scouring rollers, between the ends of the rollers and the sides of the machine, and it is essential to remove it at frequent intervals. Flocks similarly gather together on these parts of the machine, and are liable to be deposited on the fabric. To reduce this possibility to a minimum certain makers are designing plant with shaft ends outside that part of the machine in which the cloth runs, while others are increasing the distance between the ends of the rollers and the sides of the machine.

It is evident that many of the faults listed above may be avoided by attention to detail. The scouring room should be one of the cleanest in the whole factory; floors should be washed down with a hose at least once a day—an operation which will take very little time if the floor is designed so that the water flows into the drains under the scouring machine and is kept in good condition—and the machines should be kept in good working order. It is essential to keep the backs of the machines as clean as the fronts, and dirt in any form should not be tolerated. The room should be whitewashed or painted at frequent intervals, and a tradition of cleanliness developed among operatives. Spilled soap, old alkali bags, dirty flock and sud accumulated in flock boxes, and old rusty carts for carrying cloth are not seen in a well run scouring room.

Milling

This process consolidates the cloth and often determines the final character of the material. Three methods are usually employed, viz. grease milling, soap milling, and acid milling, and the operation is carried out in a rotary milling machine. Many of the defects which occur during milling are closely related to those discussed in connection with scouring, as faults which appear to be of little consequence in scoured cloth become more serious as the cloth is milled. For example, one of the most common defects is known as *mill rigging*. This arises from the cloth being milled too long in the same position, with the result that marks appear on the cloth; then run lengthways and are caused by localized felting in creases. A cloth which shows washer marks will also rig, and special care should be taken with these materials. The cloth should be removed from the machine occasionally and shaken out, and it is advisable to bag the piece. Some of the many mechanical attachments to milling machines are effective in minimizing this defect.

A common difficulty which is met in milling is that shrinkage and consolidation are slow. For example, in grease milling the cloth may shrink quite satisfactorily for the first half-hour of milling, but felting then stops, due presumably to the clogging of the fabric by the soap and oil present. The piece should then be removed from the machine, scoured in alkali, and then soap-milled. Slow milling may arise from milling at too low or too high a temperature. For acid milling *(6)* the temperature should be as high as possible, and often steam is admitted into the machine to ensure this. Care must be taken, however, that the steam does not play directly on to the cloth, or considerable damage may result. The optimum temperature for soap and grease milling, however, is about 35°C. *(6)*, and, consequently, admission of steam is seldom necessary, for heat is generally developed as the piece runs in the machine. It is essential that in soap milling the amount of liquid in the machine should be carefully regulated. Milling pieces too

dry results in excessive flocking, but if there is too much liquid present, milling may be very slow, and the appearance of the processed cloth is quite unsatisfactory. This should be borne in mind particularly when using combined scouring and milling machines. After the scouring has been completed it is essential to increase the pressure on the rollers and to run the cloth for a sufficiently long time to ensure that it is dry enough to be soaped. Unless this is done milling will be unsatisfactory, and many of the failures which have been reported in connection with this type of machine are due solely to carrying out the milling in presence of too much liquid.

Damages during milling should be few, but there is always the possibility of chafing and of tearing. A defect which is particularly common in the milling of double cloths is the migration of fibers from the face of the cloth to the back. If the face and the back are of completely different designs, this migration may have serious consequences. The only method of correcting is to redesign the fabric. Migration of fibers may take place also from one cloth to another when two or more pieces are being processed together. It follows therefore that only similarly constructed pieces should be milled at the same time in one machine. Selvedge design is particularly important in fabrics to be milled; for in many cloths, especially those of sateen weaves, there is a great tendency for the edges of the cloth to roll. Bagging of the pieces is helpful, but the real answer is to choose a suitably designed selvedge. Selvedges are usually of the hopsack type, but those with longer floats are often more satisfactory provided the cloth has not to be raised subsequently. It is interesting to note that the tendency of a cloth to curl is determined not only by the weave and the time of milling, but also by the set. Loosely set cloths are less likely to roll than are tightly set fabrics of the same structure.

Drying

After cloths have been scoured and milled they are usually dried, and this operation may give rise to considerable faults in the finished material. As much water is possible should be removed by mangling either in rope form or at width, and by hydroextraction or hydroexhaustion. Only comparatively substantial cloths can be mangled, as the more delicate fabrics are damaged and creased. Similarly, some cloths crease during whizzing, and these creases become permanent. In these cases carefully controlled open-width mangling followed by the use of a suction slot is recommended. So far as hot-air drying is concerned, the use of too high temperatures must be avoided, as the material is easily damaged. The temperature, should not in general exceed 180°F., although if the rate of evaporation is sufficiently high, hotter air might be used with advantage. The aim must be to keep the temperature of the cloth as low as possible, and this can be attained by ensuring a high rate of evaporation and by removing the cloth from the machine as soon as it has a regain of about 15%. The speed of the tenter should be adjusted so that a continuous process can be operated. If the machine runs too fast there will be inadequate drying, while if too slow, the cloth will be baked. In this connection the use of electronic devices for controlling the moisture content of the cloth has a considerable future.

More obvious defects which might occur in tentering include damaged lists due to the material coming off the tenter pins. If this happens during drying, not only is there the possibility that the cloth will be damaged but it is also likely that it will be uneven in width, and will have to be retentered. Stains are likely to arise from contact with the lubricated parts of the machine, and hence on most well designed plant as many of the bearings as possible are put on the outside and well away from the cloth. Stains and damages occur also if the cloth comes in contact with the heating pipes. Pin marks are liable to show in the finished cloth, and it is essential that the correct size of pin should be used. Probably the most serious defects which arise in tentering are discovered when the cloth is subsequently made into garments. Excessive stretching of the cloth, either lengthways or widthways, should be avoided, especially if the cloth is not to be London-shrunk. Although some stretching in width is clearly necessary to remove creases, this should be reduced to a minimum, and all attempts should be made to produce a fabric without undue temporary set. Similarly, care should be taken to ensure that cloths are tentered in such a way that squares remain square and stripes do not become curved. These defects can usually be avoided by careful work on the part of the operative.

Raising

The object of raising is to produce a pile or nap on the cloth, although this process also subdues the colors in the fabric, softens the outlines of the design, and often improves the handle. It may be used to develop certain structural features and to prepare the material for other processes such as napping. Cloths may be raised either wet or dry, wet raising being used to produce a laid pile.

A common cause of complaint among raisers is that certain pieces take too long to raise. It is not good practice to raise too quickly, as this causes the pile to be rough and uneven, but there are limitations to the time which may be spent on this process if the cloth is to be sold commercially. The speed of raising of wool fabrics is dependent on a large number of factors *(7)*, including the setting of the machines and the characteristics of the cloth. Thus the more heavily felted is the cloth, the longer will it take to produce a given amount of pile; but the denser the cloth, the closer and finer will be the pile produced. In general wet cloths raise more quickly than dry ones, although this is not true for all cloths. Acids facilitate raising, as does soap or Teepol (Shell), although reagents of this latter type cause the pile to lay more easily. The presence of Teepol is not therefore an advantage when processing blankets. Also, dyed cloths raise differently from undyed materials *(8)*. When acid dyes are used the effect is not serious, although some brown dyes cause a substantial reduction in the amount of pile produced by a given treatment on the raising machine. Dyeing with acid-milling dyes, neutral-dyeing acid dyes, direct cotton dyes, and chrome dyes causes the cloth to be more difficult to raise, but cloth dyed with Neolans (CAC) is very much more easily raised than undyed cloth. Sulfur stoving increases the ease of raising.

It is clear that uneven distribution of any of the reagents mentioned above will tend to cause uneven raising, and every care should therefore be taken to ensure that the cloth for raising is clean, and that any reagents present are uniformly distributed. Uneven raising is caused also by careless setting of the teasels, or by wrong adjustment of the card wire machine. Excessive counterpile action yields cloth with horizontal streaks, and uneven results may arise from the cloth having tight or slack selvedges. Torn selvedges are caused by uneven setting of the teasels and by the use of a wrongly designed selvedge. Those with excessively long floats should be avoided, for although they insure that the cloth does not curl during scouring and milling, they are very easily damaged in raising. Probably the most serious defect which can occur in raising is the production of weak cloth. The raising action is largely confined to the weft threads, and there is considerable reduction in weft strength. Cloth designed for raising is so constructed that this reduction in strength is not important, but often unsuitably built cloths have to be raised, and in these cases a careful watch should be maintained on the weft strength. Cloths to be drastically raised should have a high weft strength.

Finishing

Under this term are included cutting and those operations such as blowing and pressing which are intended to consolidate the fabric. Cutting must be carried out

carefully, and every care must be taken to produce a cloth of good appearance. It is essential that only a small amount of fiber is removed at each cut, for excessive fiber removal gives the cloth an impoverished handle and an uneven appearance. Two or three fine cuts are much better than one deep cut. It is essential in order to obtain the best results to have the cloth in a uniform condition. If it has been brushed and steamed, the distribution of moisture should be uniform, and the action of the setting-up roller should be uniform along its length. Rolled selvedges cause considerable trouble to the cutter, for the rolled edge of the piece is very easily removed by the cutting cylinder. Knotting should be done carefully, as otherwise there is a possibility of making holes in the piece as it passes over the cutting bed and under the cylinder. Cutting, possibly more than any other finishing process, necessitates a skilled and careful operative, for without that particular pride of accomplishment which is the characteristic of the craftsman, the setting and adjustment of the machine lack precision and the machine is not maintained at the very high standard necessary for high-class work.

Many of the defects which were discussed under crabbing may occur when the cloth is blown, but the most common are creased pieces, stains, and poor handle due to prolonged blowing or the use of excessive tension. To obtain the best results, an adequate length of wrapper should be used, so that the cloth is wound on a resilient bed of material and the possibility of stains from the blowing rollers is minimized. To avoid water marks on the cloth, condensed moisture should be removed from the steam supply before steam is blown on to the cloth. Care should be taken also in handling the cloth as it is removed from the machine after being blown, as it is then in a plastic condition and is easily marked. Excessive tension should not be applied lengthways, or the cloth will be extended and will take on a temporary set while in this state. This will give rise to shrinkage when the cloth is subsequently pressed by the tailor on the Hoffman press. By skilled use of a blowing machine, it should be possible to use blowing as the last finishing operation and to cut out much of the time spent on pressing. This, of course, does not apply to the highest-quality goods, but there are many cloths in the lower price ranges which can be handled in this way.

Excessive extension of the cloth is possible in rotary pressing but should be reduced to a minimum. The modern rotary press is much better in this respect than some of the earlier models, but there is still a tendency to stretch the cloth warpways. Temperature and pressure should be carefully controlled, and the cloth should be fed into the machine free from creases. If it is possible to allow the cloth to condition after pressing, the results obtained will be greatly improved. Both the intermittent press and the hydraulic press yield better results than the rotary machine so far as dimensional stability is concerned, but in general they are more expensive to use on account of the lower production. Provided the cloth is uniformly steamed or dewed before pressing and is carefully fed into the machine the results should be good. If white cloths are to be pressed hot, it is advisable that they should be acid, as alkaline cloths tend to become slightly yellow.

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ABSTRACTS

The Effect of Variations in Degree of Structural Order on Some Physical Properties of Cellulose and Cellulose Acetate Yarns

Robert W. Work, Textile Research Journal, page 581, Vol. XIX, No. 7, July, 1949.

The author's abstract follows:

It is shown by means of x-ray diffraction diagrams that cotton, a highly crystalline and oriented material, gives a triacetic of low crystallinity which may be rendered more crystalline by annealing. This triacetate is partially hydrolyzed to form the secondary cellulose acetate used in textile yarns, which gives an x-ray pattern showing a highly amorphous structure. Although steric effects prevent increases in crystallinity by annealing, this type of yarn can be oriented, the degree of orientation depending upon the conditions under which stretching of the yarn takes place. By swelling and allowing limited mobility, this orientation may be increased over that produced by dry stretching. Cellulose acetate fibers may be converted into highly crystalline celluloses, the orientation of the original material carrying over into a hydrolyzed product. The load-elongation characteristics of families of these 2 types of yarn are described and the effects of orientation are discussed. The decrease in lateral strength, due to orientation, is illustrated by means of electron micrographs of the material. The relationship between orientation in series of cellulose acetate and corresponding cellulose yarns having greater or lesser degrees of orientation and the sonic moduli of these materials are illustrated. Possible explanations are suggested. Dye retention similarities between mature cotton and slightly oriented cellulose yarn on one hand and immature cotton and unoriented cellulose yarn on the other hand are given to indicate that orientation may be one basic difference between mature and immature cottons.

A Study of the Bleaching of Blue Cotton Fiber

R. E. Hudson, Jr. and Howard M. Waddle, Textile Research Journal, page 421, Vol. XIX, No. 7, July, 1949.

The authors' abstract follows:

The apparent cause and location of the color in blue cotton has been studied. The color which appeared to be located in the lumen was not particularly resistant to conventional scouring and bleaching agents. The controlling factor in the bleaching of blue cotton appeared to be lack of access to the blue color in the lumen by the treating solution. No ready means of rapid access to the lumen of the whole fiber was found. Diffusion of the blue coloration through the fiber appeared to occur slowly when the fiber was placed in a mildly alkaline bath at elevated temperatures. A bibliography is given.

Report of the Committee on the Fastness of Dyes on Leather

Journal of the Society of Dyers and Colourists, page 325, Vol. 65, No. 7, July, 1949.

The committee decided to confine its activities to the standardization of tests for direct and acid dyes because of their much greater number and importance. The work of the committee was also restricted to the consideration of the fastenss of dyes on chrome-tanned leather and a procedure for the preparation of a standard leather is given. A standard dyeing procedure is also given. A number of tests were investigated but in only three cases are specific recommendations given. The reason for the rejection of other possible tests are stated. The three tests for which recommendations are made are: light fastness, penetration, and solubility.

Worsteds for Hard Wear Need Special Attention in Dyeing

K. E. Marsden, Textile World, page 129, Vol. 99, No. 4, April, 1949.

Since worsted whipcords and baratheas are often used for general utility wear where hard service is encountered, excellent finish and dye fastness are required. This article discusses the special problems the dyer may encounter with these fabrics. Dyeing methods are presented and suggestions for the selection of dyestuffs are offered.

Evaluation of Desizing Aids In Preparation for Dyeing

K. William Keller, Textile World, page 125, Vol. 99, No. 6, June, 1949.

A test method is described for the rapid determination of residual starch left in goods after preparation. Since the method is rapid and relatively simple it is a very effective laboartory control over residual starch which may cause uneven or blotchy effects in dyeing.

In principle, the test consists of comparison of a test piece with a series of standard iodine stains obtained on samples of the goods of known starch content.

The Fungi Concerned in Fiber Deterioration: II—Their Ability to Decompose Cellulose

P. B. Marsh, K. Bollenbacher, M. L. Butler and K. B. Raper, Textile Research Journal, page 462, Vol. XIX, No. 8, August, 1949.

The author's abstract follows:

On the basis of a survey of the literature and of test results here reported on more than 400 fungus isolates, cellulose-decomposing activity is shown to be very widely distributed but not universal among the fungi. It occurs with a high degree of regularity among isolates of certain genera —e.g., *Alternaria, Chaetomium, Curvularia, Fusarium, Gliomastix, Helminthosporium, Humicola, Memnoniella, Stachybotrys,* and *Trichoderma,* and probably with equal frequency in other genera which have not been so extensively studied. It occurs in a greater or smaller number of species in many of the several groups or subdivisions of the genus *Aspergillus* but apparently not in all of them, in a much smaller but rather diverse group of species in the genus *Penicillium,* apparently not at all in *Mucor, Rhizopus,* and other genera of the Mucoraceae and probably only rarely among the actinomycetes.

Tests on *Cladosporium herbarum* show that the temperature optima for growth of isolates of this fungus are in general distinctly below the approximately 30° C. used by several other workers in experiments with it; this fact is believed to account, at least in part, for the poor cellulose-decomposing activity shown by it in their tests. Tests on *Pullularia pullulans* have failed to detect cellulolytic activity.

Specificity of Microbiological Attack on Cellulose Derivatives

R. G. H. Siu, Richard T. Darby, Paul R. Burkholder, and E. S. Barghoorn, Textile Research Journal, page 484, Vol. XIX, No. 8, August, 1949.

The authors' abstract follows:

Data have been presented relating to the growth of 11 species of micro-organisms isolated from deteriorated cotton fabrics on various derivatives of glucose, mannose, cellobiose, and cellulose. A high degree of specificity was exhibited. As long as there was at least one firmly bound substituent in every anhydroglucose unit, the resulting derivative was not susceptible to microbiological attack. Under such conditions the nature of the substituent has relatively little influence on the degree of resistance imparted. This was considered to be promising theoretical support for the underlying premise on which the idea of multipurpose topochemical reactions as a means of mildewproofing cotton fabrics was proposed.

Wool Damage Data

Kermit S. LaFleur, Textile Research Journal, page 497, Vol. XIX, No. 8, August, 1949.

The author's abstract follows:

Rough categories into which wool damage may be classified for study include hydrolysis, reduction and oxidation effects, and incipient decomposition caused by exposure to light or high temperatures in the presence of air. Data have been accumulated which describe some specific effects obtained by treating woolen swatches in boiling water as a function of time, in boiling acid (sulfuric) or alkaline (sodium hydroxide) solutions over a wide pH range, in boiling reducing (thioglycollic acid, zinc formaldehyde sulfoxylate) or oxidizing (hydrogen peroxide) solutions over a wide pH range, and upon drying at 260°F. for periods ranging to 128 hours. Quantitative measures of wool damage which have been used include loss of weight, area shrinkage, alkali solubility, wettability in water and 0.1 *N* sodium hydroxide and loss of tensile strength.

Shrinkage Control of Wool by Melamine Resins: Part I—Microscopical Observations

C. Maresh and G. L. Royer, Textile Research Journal, page 449, Vol. XIX, No. 8, August, 1949.

Summary: Microscopical examination of methylated methylol melamine resin-treated wool fibers indicates that the resin is located essentially at the scale region of the fiber. The mechanism by which the modification of this portion of the fiber produces shrinkage control is at least twofold: (1) the change in the directional coefficient caused by the deposition of the resin essentially at the scale interstices and (2) the change in the elastic properties of the fiber or the so-called "setting" of the fiber, not by impregnation thereof, but rather by the formation of a semi-rigid sheath around the elastic cortex. The role played by fiber-bonding is not to be discounted, for it undoubtedly plays some part in the control of shrinkage in wool treated with methylated melamine-formaldehyde resin.

Shrinkage Control of Wool by Melamine Resins: Part II—Torsional Rigidity and Elastic Properties of Single Fibers

H. R. McCleary and G. L. Royer, Textile Research Journal, page 457, Vol. XIX, No. 8, August, 1949.

Summary: It has been shown that treatment of single wool fibers with a methylated methylol melamine-type resin has no effect on the work of extension, but produces a marked increase in the torsional rigidity. Successive extensions of a treated fiber cause gradual decreases in the rigidity, which approaches that of the untreated fiber. These results are interpreted to mean that resin treatment affects only the surface portion of the wool fibers; this modified surface structure must, therefore, be chiefly responsible for the shrinking resistance of wool fibers.

The results of the present work are in complete agreement with those of Maresh and Royer (see abstract above).

(Concluded on Page 658)

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REPORT OF THE NOMINATING COMMITTEE

The Councilors representing Sections, in their capacity as Nominating Committee, have instructed the Secretary to report nominations for officers in 1950 as follows:

For President:

C. NORRIS RABOLD

For Vice-Presidents, two to be elected:

ARTHUR W. ETCHELLS
GEORGE O. LINBERG
LEONARD S. LITTLE
WALTER M. SCOTT

If additional nominations for either office, signed by at least twenty-five senior members, be filed with the Secretary not later than October eighth, they will be listed on the ballot in accordance with the Constitution, in equal standing with these reported by the Committee.

Respectfully submitted,

H. C. CHAPIN
Secretary

"Analytical Methods for a Textile Laboratory"

CONTENTS:

General Instructions
Standard Solutions
Reagents
Methods of Sampling
Methods of Analysis of Chemicals
Determination of Finishing Materials
and
Determination of Resins and Resin Finishes
Identification of Dyestuffs on the Fiber
Determination of Textile Fibers
Useful Tables and Calculations

This book of 287 pages, attractively bound, and well indexed, may be obtained from the Secretary, A.A.T.C.C., Lowell Textile Institute, Lowell, Massachusetts, postpaid, for six dollars. To A.A.T.C.C. members, for one copy only, the price is five dollars.

PRELIMINARY PROGRAM FOR ATLANTIC CITY CONVENTION

MEMBERS have recently received a preliminary program and information sheet for the 1949 Convention to be held October 13, 14 and 15 at the Chalfonte-Haddon Hall, Atlantic City, New Jersey, under the auspices of the Philadelphia Section. The Official Program will be distributed at the Registration Desk of the Convention and will also be published in the Convention Issue of the *American Dyestuff Reporter*.

The following is the tentative program.

Thursday, October 13th

9:30 A.M. — REGISTRATION — Lobby, Haddon Hall.

9:45 A.M.-12:30 P.M. — NATIONAL COUNCIL MEETING — Benjamin West Room.

2:00 P.M.-5:00 P.M.—EXHIBITS—Main Floor.

2:00 P.M.-5:00 P.M.—PERSONNEL SERVICE—Room 1344

2:00 P.M.-5:00 P.M.—GENERAL TECHNICAL SESSION — Viking Room. Arthur W. Etchells, Hellwig Dyeing Corp., Philadelphia, Pa., *Presiding*.

"Current Research at Textile Research Institute Laboratories", Dr. J. H. Dillon, Textile Research Institute, Princeton, New Jersey.

"Textile Education and Research", Bertrand W. Hayward, Philadelphia Textile Institute, Philadelphia, Pa.

"Fundamental Studies of Combustion", Dr. W. George Parks, Rhode Island State College, Kingston, Rhode Island.

5:00 P.M.—ANNUAL BUSINESS MEETING—Viking Room. Henry F. Herrmann, A.A.T.C.C. President, *Presiding*

5:00 P.M.—LADIES COCKTAIL PARTY —Benjamin West Room

6:30 P.M.—OLNEY AWARD DINNER —Vernon Room. George H. Schuler, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware, *Toastmaster*

8:00 P.M.—MOVIES for LADIES—Viking Room

Friday, October 14th

9:30 A.M. — REGISTRATION — Lobby, Haddon Hall

9:30 A.M.-12:00 Noon — PERSONNEL SERVICE—Room 1344

10:00 A.M.-10:00 P.M. — EXHIBITS — Main Floor

9:30 A.M.-12:00 Noon—NON-CELLULOSIC GROUP MEETING—Benjamin West Room. Henry E. Millson, Calco Chemical Division, American Cyanamid Company, Bound Brook, New Jersey, *Presiding*

"The Occurrence of Soluble Wool Substance as a Result of the Sulfuric Acid Carbonizing Process," J. Bauer, Fred Whitaker Co., Philadelphia, Pa.

"Dyeing of Helindrones on Wool", Dr. H. Luttringhaus, General Dyestuff Corp., New York, New York.

"Dyeing of Orlon", Dr. P. L. Meunier, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware.

9:30 A.M.-12:00 Noon—AUXILIARIES and TESTING GROUP MEETING—Viking Room. Dr. Milton Harris, Harris Research Laboratories, Washington, D. C., *Presiding*

"Use of Tristimulus Values in Specifications of Small Color Differences", Dr. I. H. Godlove and H. R. Davidson, General Aniline and Film Corp., Easton, Pa.

"Evaluation of Wetting Agents: *a.* Tape Wetting Tests: *b.* Theory and Interpretation of Wetting Tests", L. S. Shapiro, Synthron, Inc., Ashton, Rhode Island.

"Textile Detergency Research at the Institute of Textile Technology", Dr. W. P. Untermohlen, Jr., Institute of Textile Technology, Charlottesville, Virginia.

"Static Problems in Textile Processing", D. H. Lehmicke, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware.

"Modification of Fiber and Fabric Properties by Wrinkleproofing and Stabilizing Agents," A. C. Nuessle and D. D. Gagliardi, Rohm and Haas Co., Inc., Philadelphia, Pa.

2:00 P.M.-5:00 P.M.—PERSONNEL SERVICE—Room 1344

2:00 P.M.-5:00 P.M.—INTERSECTIONAL CONTEST—Vernon Room. Patrick J. Kennedy, E. I. du Pont de Nemours & Co., Inc., New York, N. Y., *Presiding*

4:00 P.M.—LADIES TEA and FASHION SHOW

8:00 P.M.—LADIES ENTERTAINMENT

Saturday, October 15th

9:30 A.M. — REGISTRATION — Lobby, Haddon Hall

9:30 A.M.-12:00 Noon — PERSONNEL SERVICE—Room 1344

10:00 A.M.-4:00 P.M.—EXHIBITS—Main Floor

9:30 A.M.-12:30 P.M. — CELLULOSIC GROUP MEETING—Benjamin West Room. Dr. Arnold M. Lippert, Joseph Bancroft and Sons Co., Wilmington, Delaware, *Presiding*

"Bleaching of Cotton: A Proposed Continuous Hypochlorite Bleach Process", L. P. Seyb and J. L. Foster, Diamond Alkali Co., Painesville, Ohio.

"Important Factors in Cotton Dyeing", O. W. Clark and Dr. H. R. McCleary, Calco Chemical Division, American Cyanamid Company, Bound Brook, New Jersey.

"Ageing Troubles and Controls", P. J. Choquette, General Dyestuff Corp., New York, N. Y.

"Investigation of the Anticrease Treatment of Cotton", Dr. R. F. Nickerson, Monsanto Chemical Co., Everett, Massachusetts.

9:30 A.M.-12:30 P.M. — HOSIERY GROUP MEETING—Viking Room. Virgil T. Hartquist, Jefferies Dyeing Works, Chester, Pa., *Presiding*

"A Survey of Recent Developments in Wet Processing of Full-Fashioned Hosiery", H. L. DeTurck, Berkshire Knitting Mills, Reading, Pa.

"Nylon Staple", D. H. Heckert, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware.

"Chemical Reactivity of Wool in Relation to Antishrink Process", Dr. P. A. Alexander, Woolsey, Ltd., England.

6:30 P.M.—ANNUAL BANQUET—Carolina Room, Chalfonte Hotel. James Dixon, Calco Chemical Division, American Cyanamid Company, Philadelphia, Pa., *Toastmaster*

Introduction of Guests

Intersectional Contest Awards

President's Address, Henry F. Herrmann

Main Address (Speaker to be announced later)

Rhode Island Section—

CURRENT TRENDS IN OPERATING RUBBER COVERED ROLLS IN TEXTILE FINISHING*

ASA F. FISK
Sales Engineer, Stowe-Woodward, Inc.

THE increasing emphasis on the dual factors of quality and cost in the finishing of textiles would seem to set the stage for a discussion of the part played by rubber covered rolls in achieving improved quality and lower operating costs.

Most finishers have, at one time or another, paid vigilant attention to the problem of selection and operation of rubber covered rolls, with the inevitable result that they may well be considered experts on these subjects, especially as far as their own fabrics are concerned.

Many such finishers, in reviewing their past experience with rubber covered rolls, are coming to the conclusion that they play a much more important part in processing textiles than is generally realized.

Recent research seems to give strong support to this conclusion, and the purpose of this paper is an attempt to tie together segments of practical operating data, gathered over a period of years, with some of the rather provocative implications of certain research programs.

In analyzing even the simplest of dyeing operations utilizing a single pair of squeeze rolls, there may be as many as twenty recognized variables involved. The effect of these upon the finished product varies in importance from the vital to the relatively inconsequential.

Going a step further for the purpose of this discussion, let us concentrate on this pair of rolls and upon the nature and magnitude of the variables revolving around the nip of these rolls. If we do this, we are at once impressed by the fact that the pressure applied to the rolls will probably be the factor of the greatest magnitude in terms of finish.

For example, when we think of a pair of rubber covered rolls in a padder, we are passing a piece of cloth between the nip of the rolls and taking out a certain amount of the finishing solution already in the fabric. Generally speaking (and there are exceptions), the more pressure applied to the nip the greater the amount of solution removed.

At this point in the picture many finishers run into their most obvious source of loss due to uneven finish. If the extraction varies across the nip, wet centers or wet edges will result in uneven finish or dye in the finished goods.

Similarly, if the total pressure is allowed to vary during a run or between runs, there will be a difference in the extraction obtained the long way of the goods and a difference in the finish. The more "critical" the dyestuff or finishing agent, the more easily apparent the difference in shade or finish.

The side to side variation, obviously may be due to a variety of factors such as an under-strength iron body which deflects under pressure, poor choice of density or of type of rubber or synthetic compound used in the covering, inaccurate grinding of crowning, etc.

Variations in the run of the piece are normally due to variations in applied pressure, with other possibilities of minor importance such as speed changes, tension changes, heat of solution, etc.

While these reasons for trouble are of course obvious, there is a very important factor that has generally been woefully underestimated by finishers. This cause of variation, termed "machine-fatigue", has been the subject of much speculation and considerable recent study.†

Measurement of "Machine-Fatigue"

With a new padder in perfect condition, pressure applied to the top rolls (by a system of compound leverage and weights, or by a pneumatic or hydraulic cylinder with or without simple or compound leverage) actually reaches the nip of the rolls, and the extraction obtained is uniform from piece to piece, run to run, day to day.

With continued use, however, the machine will begin to show wear at linkage points in the leverage system, wear in the vertical slides, binding of lever arms, rusting and "freezing" of linkage pins, etc. And this occurs even with a preventive maintenance schedule that is seemingly adequate, for most of these conditions are not visible and can only be corrected by dismantling and carefully reconditioning the whole leverage system.

"Machine-fatigue" has been found to account for many of the great mysteries of rubber roll operation, such as when a new rubber covering (identical in all respects to its predecessor), is installed but cannot be made to work; or when a new or reground roll gives erratic results from day to day or shift to shift.

The magnitude of "machine-fatigue" has been measured in two ways: by inserting weight-recording instruments in the leverage system and, probably more accurately, by measuring and tabulating the extraction obtained on a machine in poor condition and comparing it with the extraction obtained after renovation. While no example can be given as typical, extraction may easily be 15% to 20% higher or lower than normal, and uncontrollable within that range. Such results undoubtedly led to the famous words of the weary finisher, "But we can't dye everything black."

This variable is a major cause of disparity from piece to piece. It may even be of sufficient magnitude to cause varying deflection of the roll body, which may increase side to side variation.

The answer to "machine-fatigue" is the treatment of all mechanisms applying pressure to rubber covered rolls as though one were planning to use them as scales for weighing expensive dyestuffs. Any finisher can well be suspicious and very hard to please on this score whenever an unaccountable and uncontrollable variable starts rearing its head.

* Presented before the Rhode Island Section, May 20th, 1949.

† The writer wishes to acknowledge the invaluable assistance given him by recent work of Mr. Malcolm M. Eckhardt, Research Department, Sidney Blumenthal and Company, Shelton, Connecticut.

High Pressure Operation of Rubber Covered Rolls

Passing from these few thoughts on the application of consistent and even pressures, it is also important from a cost angle to note what effect recent trends in textile finishing equipment have on the so-called routine maintenance and operation of rubber covered rolls.

During the last ten years the trend has been towards heavier padders and mangles, operating at higher speeds and with much higher nip pressures. Where, ten years ago, a normal pressure applied to the nip might be approximately 100 to 125 lbs. per lineal inch of face, one now finds pressures up to 400 and 500 lbs.

Such day to day pressures cause manufacturers of rubber covered rolls some uneasiness, and many well-established producers have suggested a pressure limit of approximately 300 lbs. per lineal inch to insure reasonably satisfactory life from a padder or mangle roll covering.

Judging, however, by the results of recent laboratory tests and operations in the field, it would seem unlikely that a progressive finisher would pay much attention to the roll-maker's lament. For there are many points in finishing plants where maximum extraction is desirable and economic. And while a normal curve of extraction tends to level out in the higher pressure ranges, there are many instances where the simplest of calculations will show the savings inherent in higher pressures.

Another reason for operating at high pressure is fairly obvious when one considers that in the higher pressure ranges it takes a considerable variation in applied pressure to cause an appreciable variation in the percentage of extraction. A drop in air or water pressure activating pressure devices or related mechanisms would generally tend to cause less variation in finishing than corresponding drops in lower ranges of pressure.

The answer to high pressure operation of rubber covered rolls seems to lie in a review of the economies involved.

At nip pressures of 100 to 125 lbs. per lineal inch the length of time between regrindings might be estimated at 5 to 6 months or longer, with a normal covering life of perhaps 5 to 6 years. At pressures of 400 lbs. per lineal inch, it seems more probable to expect runs of 4 to 5 weeks between regrindings and probably a covering life of less than two years. These figures would naturally vary with the type of fabric run as well as other factors of the operation.

At high pressures it is normal to expect relatively rapid wear of the used face of the roll, with resulting high ends and very high localized pressure at these points. As a danger signal small pressure cracks may appear, and unless the roll is promptly ground these may be followed by deeper cracks and eventual tearing or fracture of the covering.

Even in the absence of such easily apparent danger signals, we should face the fact that under high pressures the pattern of wear is sharply accelerated and failure to follow a careful maintenance program will lead to unnecessary loss of covering and down time, in addition to the possibility of shaded or damaged goods in the interim.

Most rubber roll manufacturers have bulletins available on the general subjects of storage, maintenance and operation of textile rolls, and since high pressure operations involve more exacting standards, a review of current bulletins might be timely and profitable.

Also available without charge are roll record systems which markedly assist in determining necessary grinding schedules and in calculating costs of roll operation.

Savings in High Pressure Operation

Against shorter roll life and increased roll maintenance must be weighed actual or potential savings which in many instances tend to make both increased roll covering and roll maintenance cost look unimportant by comparison. For some examples let us look to the finishing plants.

By increasing pressure from approximately 300 to 400 lbs. per lineal inch, one finisher reduced the building up of a finishing agent on tenter clips with a saving in cleaning expense figured at $125.00 per week. In eight weeks these savings had already accumulated to $1,000.00, and even if partially offset later by unusually high maintenance or recovering cost, the increase in pressure gives every indication of a resulting net saving of well over $5,000.00 per year.

Another finisher, in increasing pressure from 180 lbs. per lineal inch, to 250 lbs. per lineal inch (judged the safe limit on an old machine) estimated savings in lowered drying costs at the not inconsiderable sum of $1,250.00 for twelve months of normal operation.

In many instances, operating at high pressures has permitted increases in speed which would probably have been attained only through a large addition to dryers.

These potential savings are most frequently found in operations where maximum extraction is indicated before drying, where there is unnecessary dilution of finishing solutions due to excessive carry-over from a previous nip, or where there is an unreclaimed and unnecessary loss of finishing agents. When working with expensive chemicals, the potential savings may run to impressive figures.

It would be well to inject a warning note that high pressure operation is not a "cure-all". Indeed, this concept could well be considered a fallacy where used blindly and without careful study of the operation. For, as previously noted, there are exceptions to the general rule that high pressure gives profitably improved extraction. In such instances the only result might be to distort or damage the fabric.

Application of Recent Research

Recent studies into the operation of rubber covered rolls have been aimed at identifying and evaluating the variables involved. What effect, for example, does density or hardness of a pair of rolls have upon results? Or, what is the effect of speed, tension, degree of saturation, heat, pressure, width of nip, angle of entrance, diameter of rolls, to name but a few?

Many of these factors have been touched upon in various papers presented to Sections of this Association, and others will undoubtedly be covered in subsequent discussions. While it is not the purpose of this paper to review any of these findings or work in progress, it might be appropriate to list some current thoughts on the practical application of known data to rubber roll operation.

The first step would be to review operations involving squeeze rolls by analyzing individual finishing operations in terms of desired extraction at the nip of each pair of rolls. What is the extraction now? What changes might lower costs or improve quality of finish?

Research might tell us that on the fabric in question (let us say an 80 x 80 cotton print cloth) we could vary two factors in the operation, namely pressure and roll density, while varying extraction from a wet 140% to a reasonably dry 49%. The finisher might determine that he actually wants 85%, and wants it evenly distributed across the fabric.

With these two stipulations, the manufacturer of rubber covered rolls can enter the discussion intelligently with his suggestions as to the various ways the 85% might be obtained, noting advantages and disadvantages of various possibilities. Research has again entered the picture in a small way, but it has still permitted the predetermination of a result instead of necessitating the use of a crystal ball.

This little example could be complicated by adding a large number of variables, but it would seem safe to say that specific results can be more accurately forecast in every instance than they could have been prior to recent research progress.

Correlation of Laboratory and Production Results

In closing, there are several points which might be of interest on the subject of correlation of laboratory and production results.

In many instances textile chemists have admitted some discouragement in making and correlating extraction tests on fabrics. Tests on swatches have shown erratic variations, and chemists have frequently gone to the extremes of weighing whole runs of cloth to check their findings, only to obtain still another figure. In a number of plants these variations have been found to tie in with the "machine-fatigue" noted previously. In short, the swatch tests were probably an accurate measure of actual mechanical inaccuracy, and did not constitute an error on the part of the chemist or his assistants.

Carrying this same thought a bit further, a visit to many textile laboratories will disclose a "laboratory padder". This usually consists of several small rolls more or less on the order of the pair of wringer rolls found on a domestic washing machine, though occasionally one sees a somewhat improved version.

Recent tests indicate that it is impossible to correlate results obtained on such light-duty rolls with production runs on heavy padders. The answer appears to lie in a heavy-duty padder with short face rolls, a less expensive duplicate of the production padder.

This last should not be construed as a "plug" for rubber roll manufacturers searching for new business, but rather as an expression of our responsibility in attempting to serve the textile finishing industry.

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Old Reporters Wanted

TO meet the requirements of libraries for complete volumes of the *American Dyestuff Reporter*, the Association needs the following issues:—

Year 1937, No. 2, Jan. 25
Year 1937, No. 15, July 26
Year 1937, No. 19, Sept. 20
Year 1938, No. 3, Feb. 7
Year 1938, No. 16, Aug. 8
Year 1939, No. 4, Feb. 20
Year 1940, No. 17, Aug. 19
Year 1942, No. 1, Jan. 5
Year 1943, No. 24, Nov. 22
Year 1946, No. 1, Jan. 14

For copies of these issues, mailed to the Secretary, A.A.T.C.C., Lowell Textile Institute, Lowell, Mass., fifty cents each and postage will be paid.

Correspondence on Monograph No. 1

American Association of Textile Chemists and Colorists
August 18, 1949.

Prof. Percival Theel,
Philadelphia Textile Institute,
Broad and Pine Streets,
Philadelphia 2, Pa.

Dear Percy:

I have just received a copy of Monograph No. 1—

"ANALYTICAL METHODS FOR A TEXTILE LABORATORY—1949"

and wish to complement you and your committee for what appears to be a grand piece of work. I have complete faith in the quality and accuracy of the text. What concerns me particularly is the innovation which this textbook represents as a new activity for our Association. Dr. Walter Scott's committee did a fine job in organizing our original set of testing methods but the scope of your committee's work is so much larger that it calls for special recognition. Not the least of what can be said about Monograph No. 1 is that it sets a high quality pattern for succeeding monographs.

We hope that this monograph will be commercially successful, but even though it should fail to produce pecuniary profits it would still rank high in our estimation as a service to the industry and to the educational institutions which are training the technical personnel for it.

A simple "thank you" to you and your committee, seems like a small return for your labors. However, I hope that its sincerity, shared by the thousands of our members who will eventually see this volume, will compensate you for your efforts.

Sincerely yours,
HENRY F. HERRMANN
President

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September Meeting, Northern N. E. Section

THE September meeting of the Northern New England Section will be held on Friday, September 16th, at the Andover Country Club, Andover, Mass. Dinner will be at 6:00 P.M.

Dr. Walter J. Hamburger, Director, Fabric Research Laboratories, Inc., Boston, Mass. will speak on "Research Problems, Foreign and Domestic". Dr. Hamburger visited the textile research centers of Europe recently and will present a down-to-earth discussion of the role of research worker, technologist, management and operative, in relation to problems of industrial application of new knowledge.

Harold W. Leitch, General Superintendent in charge of Research, Pacific Mills Worsted Division, Lawrence, Mass. will give an informal illustrated talk on his recent travel in Europe, "A Yankee Abroad".

Dinner reservations should be made with Edward B. Bell, Textile Aniline & Chemical Company, 49 Blanchard Street, Lawrence, Massachusetts.

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Southeastern Section Activities

A MEETING of the Southeastern Section will be held on October 1st, in the Harrison Hightower Textile Building of the A. French Textile School, Georgia Institute of Technology. This is one of the first meetings to be held in the new building. Members of the Section are invited to inspect the facilities of the building in advance of the meeting.

The technical and business session will begin at 4:00 o'clock and George Royer, Calco Chemical Division, American Cyanamid Company, will speak on "Some Scientific Aspects of Dyeing and Printing." At 6:30 P. M. there will be a banquet in the Georgia Tech dining hall to be followed by an adress by C. Norris Rabold, Erwin Cotton Mills Company, National A.A.T.C.C. Vice-President. This meeting will be a joint meeting with the Georgia Tech Student Chapter and Mr. Rabold's theme will be "Student Chapters and the National AATCC Organization."

The December 3rd meeting of the Section will also be held at Georgia Tech and an extremely interesting program is being planned.

Members of the Southeastern Section have been invited to attend the Summer Outing of the South Central Section, September 9-11.

EMPLOYMENT REGISTER

This column is open for four insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association. Lowell Textile Institute, Lowell, Mass. It is understood that these will be open to inspection by prospective employers, who can obtain further information from the Secretary.

49-22

Education: Graduate of Bradford Durfee Technical Institute, with honors.

Experience: Summer in textile mill laboratory.

Age 20; girl; unmarried; references; vicinity of Providence, R. I. preferred.

8-22, 9-5, 9-19, 10-3

CALENDAR

SOUTH CENTRAL SECTION

Outing: September 9 to 11 (Lookout Mountain Hotel, Chattanooga).

PHILADELPHIA SECTION

Meetings: September 16, November 11 (Kugler's, Philadelphia).

PIEDMONT SECTION

Meeting: November 5 (Charlotte Hotel, Charlotte, N. C.

HUDSON-MOHAWK SECTION

Meetings: September 16, November 18.

NEW YORK SECTION

Meetings: September 23, November 18 (Swiss Chalet, Rochelle Park, N. J.)

NORTHERN NEW ENGLAND SECTION

Meetings: September 16 (Andover Country Club), November 4 (Lowell Textile Institute), December 2 (Boston).

WESTERN NEW ENGLAND SECTION

Meetings: September 23 (Waverly Inn, Cheshire, Conn.), November 4 (Rapp's Restaurant, Shelton, Conn.), December 9 (Danbury, Conn.)

SOUTHEASTERN SECTION

Meetings: October 1, December 3 (A. French Textile School, Georgia Institute of Technology).

COUNCIL

Meetings: September 9 (The Warwick, New York), December 9 (New Yorker, New York).

RESEARCH COMMITTEE

Meetings: Sept. 9, Dec. 9.

NATIONAL CONVENTIONS

1949: October 13 to 15, Chalfonte-Haddon Hall. Atlantic City.

1950: September 28 to 30, Portsmouth, N. H.
1951: October 18 to 20, Statler, New York.
1952: Boston.

New York Section to Meet on September 23rd

THE first meeting of the New York Section for the 1949-50 season will be held on September 23rd at Kohler's Swiss Chalet, Rochelle Park, New Jersey.

Weldon G. Helmus, Fair Lawn Finishing Company, Technical Program Chairman, announces that the speaker will be Dr. Reginald G. Wakeman, Director of Research of Onyx Oil and Chemical Company, whose subject will be "The Chemistry of Commercial Plastics." Dinner reservations may be made with John H. Hennessey, treasurer.

Western New England Section to Meet September 23rd

A meeting of the Western New England Section will be held on September 23rd at the Waverly Inn, Cheshire, Conn.

The speaker will be André Blumenthal of Sidney Blumenthal & Company. His subject will be: "Management and Research."

Other meetings of the Section are scheduled for November 4th at Rapp's Restaurant, Shelton, Conn., and December 9th in Danbury.

Rain Tester Blotting Paper

In the interests of uniformity and reproducibility in making tests with the A.A.T.C.C. standard Rain Tester a specially manufactured lot of blotting paper has been made exclusively for textile work. Satisfactory inter-laboratory tests have been completed on a representative cross-section of this lot, and the paper is now available for purchase from:

STANDARD PAPER MFG. CO.,
RICHMOND, VA.

Attention: J. S. WALDEN, SALES DEPT.

Stock Size:—24"x38"—240 lb. per ream (500 sheets).

Minimum Order: 25 lb. (Approx. 50 sheets —24"x38").

Price (Subject to change):
For ¼ ream—27c. per lb.
For less than ¼ ream—34c per lb.

The manufacturer is willing to cut these sheets to 6"x6" or any other desired size at a charge of $1.00 per ream ($1.00 minimum cutting charge). When ordering, specify "WHITE A.A.T.C.C. TEXTILE BLOTTING" and send order direct to the manufacturer.

In the past it was found difficult to obtain reproducible results or good correlation in inter-laboratory tests through the use of blotters furnished by different manufacturers or even by the same manufacturer. Because of this situation arrangements were made solely with the above company for the manufacture of a special lot of uniformly-made blotting paper. The manufacturer guarantees to furnish a continuous supply of uniform paper.

LAPEL BUTTONS FOR A.A.T.C.C. MEMBERS

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These buttons bear the seal of the Association and may be purchased by members in good standing from the National Secretary at $2.00 each.

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DR. H. C. CHAPIN
Lowell Textile Institute
Lowell, Mass.

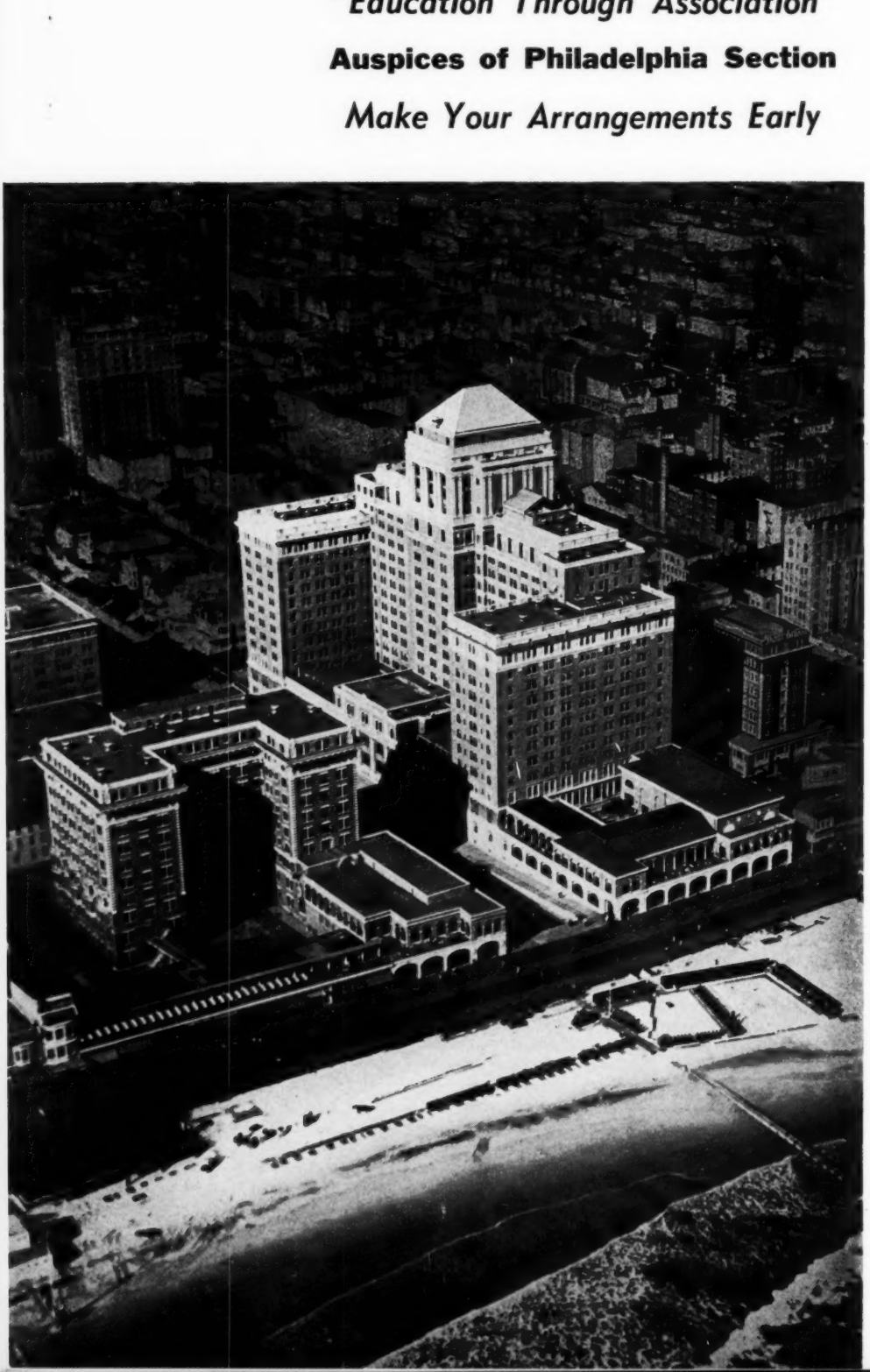
ATLANTIC CITY CONVENTION

OCTOBER 13-14-15

"Education Through Association"

Auspices of Philadelphia Section

Make Your Arrangements Early



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CHALFONTE-
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1949
A.A.T.C.C.
CONVENTION
CENTER

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TRADE NOTES • NEW PRODUCTS

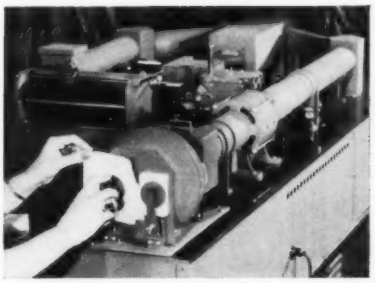
• G. E. Mill Modernization Program

The General Electric Company announced, in a press premiere at the Waldorf-Astoria in New York, a Textile Mill Modernization Program which seeks "increased and more refined electrification" in the textile industry as the key to lower costs, improved quality, and better working conditions.

The new textile mill modernization program is believed to be the first comprehensive visual program devoted exclusively to a review of major modernization trends in the industry. It is said to be designed to show how textile mills can increase productivity, improve product quality and reduce costs through increased use of modern equipment and processes.

The program includes a sound-color motion picture "Textiles Unlimited", and a 104-page manual, "How Textile Mills are Modernizing". A product of two years' research and reporting, it is claimed, the film shows new equipment and processes under development in laboratories, pilot plants, and mills throughout the East. It will be made available for showings to textile mills, textile machinery manufacturers, and others associated with the industry.

"Mill conditioning"—the installation and use of modern lighting, air conditioning, materials handling, and power distribution equipment—is shown as one of the major trends in the industry today as progressive mills strive for better working conditions, more efficient production, less down time and waste, and better quality.



Spectrophotometer being used for matching colors to international color standards.

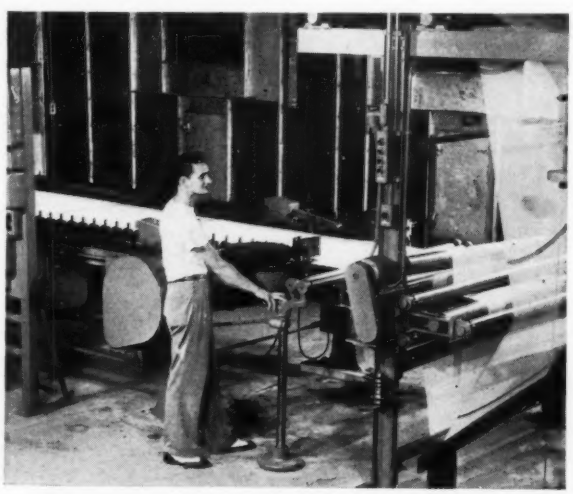
Applying motors at the direct point of power use is depicted as important to gain the advantages of efficient machine design and performance, added safety and flexibility, better arrangement and saving of space.

The film also is designed to show that higher controlled speeds are possible through the use of automatic "electronic brain" controls and that finer quality control can be attained through utilization of such modern devices as the spectrophotometer, the weft-straightener, and stroboscopic lights for inspection of cloth. Growing use of infra-red lamps and dielectric heating equipment in the industry is cited as another important trend.

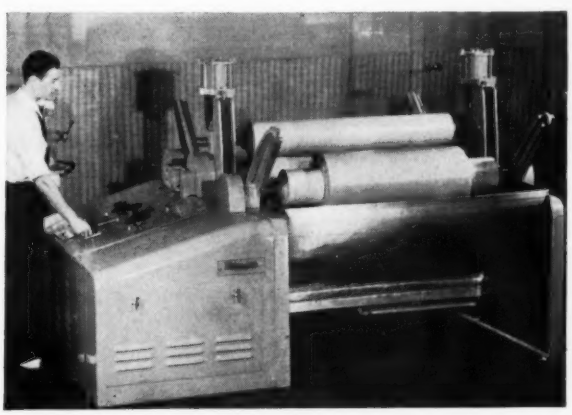
The growing importance of continuous processing, the use of two or more machines electrically co-ordinated to function as one unit, is illustrated by the film as still another significant way of minimizing production costs and improving quality.

Modern hoist equipment used to move beams in a textile mill dye room solves a materials handling problem.

The manual describes major modernization trends in the textile industry. Among the topics discussed are modern methods of material handling, comprehensive mill



Electronic weft-straightening of cloth at a Southern finishing plant.



New dye jig with precise electrical control in operation in a textile finishing plant.

conditioning, higher average machine speeds, finer quality control, and new processing methods.

Topics of particular interest to wet processors include: comprehensive mill conditioning, finer quality control, continuous processing, batcher drives, cloth printing machine drive, range drive, recording spectrophotometer, weft and tenter-rail guider controls, roller dryer drive, dielectric and infra-red heating and many others.

Principal speakers at the premiere included J. W. Holt, Manager of Sales for the Textile Industries Section of the Manufacturing Industries Division; F. W. McChesney of the Industrial Division and G. W. Knapp, Manager of the Paper and Textile Division of the Industrial Engineering Divisions.

Following the presentation of the film a discussion panel was held in order to clarify questions raised during the presentation.

• 31st ASA Meeting

An address by Karl T. Compton, chairman, Massachusetts Institute of Technology, and chairman, Research and Development Board of the National Military Establishment, will climax the four-day series of conferences at the Thirty-First Annual Meeting of the American Standards Association October 11-14. Dr. Compton will speak at the Annual Meeting Luncheon Friday October 14. The meeting is to be at the Waldorf-Astoria Hotel in New York.

Meetings of sectional committees and correlating committees will open proceedings on Tuesday, October 11. The Company Member Conference will convene on Wednesday October 12, and the Conference of Executives of Organization Members of the ASA will meet Thursday morning October 13. Tentative plans for Thursday afternoon have been made to hear reports on international developments in standardization by representatives of the American delegation who attended the summer meetings of the International Organization for Standardization in Paris. In the evening the Board of Directors will meet, and the Standards Council will go into session on Friday morning October 14.

Following the Annual Meeting Luncheon Friday, October 14, the Board of Directors and the Standards Council will meet together. This meeting will be open to ASA Members.

• Niacet Transfer

Arthur A. Boucher has been transferred to the Sales Department, Niacet Chemicals Division, U. S. Vanadium Corporation, a Unit of Union Carbide and Carbon Corporation. Mr. Boucher, formerly Research Chemist in the Sales Development Laboratory, succeeds Mr. James A. McCusker who recently resigned.

• Durimet 20 Sheet and Plate

Official announcement of the production and availability of Durimet 20 sheet and plate is being made for the first time by the Duriron Co., Inc., Dayton 1, Ohio.

The Durimet 20 analysis is said to have been developed during the war for severe corrosive applications that the standard 18-8 stainless steels did not withstand. The most notable and widespread application is claimed to be for handling sulfuric acid.

Durimet 20, it is claimed, can be satisfactorily applied to corrosive services formerly uneconomically handled by nonmetallics of insufficient strength or heat transfer, or by extremely high priced metals, or by low price metals with short life. While higher in price than ordinary stainless steels it may in some services outlast it by 100 to 1 or simply indefinitely, it is stated.

Production for stock has commenced, being confined chiefly to gauges 24 to 11 and to the smaller thicknesses of plate. The range is from 24 gauge to ¾" plate.

Complete information on this material can be had by writing The Duriron Co., Inc., and asking for Bulletin 502.

• Electronic System Controls Processes

Electronic systems for controlling paper and textile processes have been developed by Brown Instruments division of Minneapolis-Honeywell Regulator Company.

The new systems entail the use of a Moist-o-Graph in combination with a new electronic transmitter, making it possible to use either electric or pneumatic controllers in conjunction with the electronic measuring instrument, according to L. M. Morley, vice president and general sales manager.

Various models of the new system are said to be made specifically to operate on cotton slashers, rayon or combination slashers and air-dry slashers for the textile industry, and on paper-making and paper-coating machines. These cover moisture recording and speed control, moisture recording and temperature control and moisture control and signaling. The systems are available for early shipment.

• Gurley Appointed

The American Textile Company Inc., of Pawtucket, Rhode Island and New York City, announces the appointment of Martin H. Gurley, Jr. as research director for the company. Mr. Gurley was previously in charge of textile and paper research and development at the Esselen Research Corporation of Boston, Massachusetts.

Arthur C. Merrill, Jr.

• Arnold-Hoffman Appointments

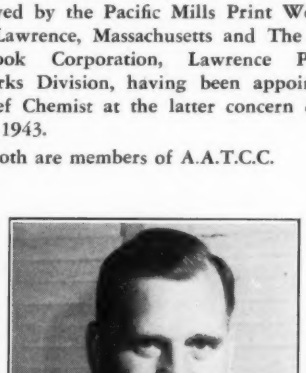
James A. Davies has been appointed to the Sales Staff, with headquarters in the Providence Office of the Arnold, Hoffman & Co. Incorporated. Mr. Davies has been connected with Arnold, Hoffman & Co. Incorporated, since 1946, during which time he has been primarily engaged in supervising the Sales Service and Application Laboratories.

Mr. Davies was graduated from New Bedford Textile Institute in 1934, after which he was employed by the Appenaug Company until 1944, where he carried out both laboratory and plant development work. From 1944 until 1946, Mr. Davies was connected with the Normandy Print Works as a colorist.

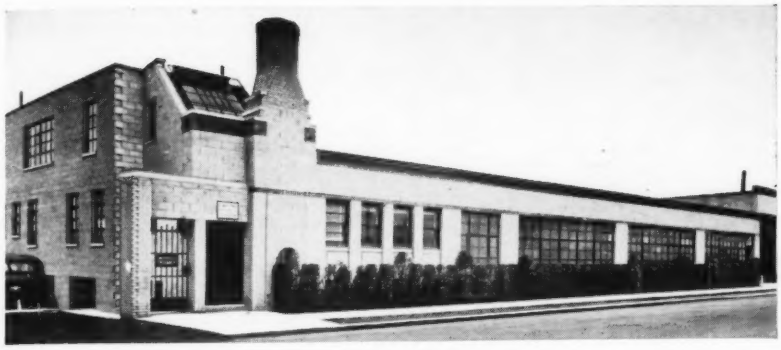
Arthur C. Merrill, Jr., has been appointed to replace Mr. Davies and work out of the main office in Providence, R. I.

Mr. Merrill attended Massachusetts State College and obtained a B. S. degree in 1934. Since that date, he has been employed by the Pacific Mills Print Works of Lawrence, Massachusetts and The Aspinook Corporation, Lawrence Print Works Division, having been appointed Chief Chemist at the latter concern during 1943.

Both are members of A.A.T.C.C.



James A. Davies



New Commonwealth Plant

• Commonwealth Moves

Commonwealth Color & Chemical Co. announces the removal of their Factory, Laboratories and Main Office to their new plant located at 3240 Grace Avenue, New York 67, N. Y. as of September 1st, 1949. This firm has supplied the Textile, Leather and Allied Trades for over 40 years with products manufactured by them and during this time absorbed a number of other companies. For the past 30 years their factory was located at Nevins, Butler and Baltic Streets in Brooklyn, N. Y. To better serve their customers, they are moving to this new modern streamlined plant which is claimed to be one of the finest compact chemical plants in the country.

• Taylor New Sales Agents

E. B. Taylor Company, 442 Colyton Street, Los Angeles 13, California, has been appointed sales agent for Nuodex Products Co., Inc., Elizabeth F, N. J. in the Southern California area, Utah and Arizona, replacing Anderson Associates which has announced the sale of their agency assets to the new representatives.

The Taylor Agency will continue to maintain warehouse stocks of all Nuodex materials. Under the direction of Ed Taylor, head of the organization and Vice-President of the Los Angeles Paint, Varnish and Lacquer Association, the company also represents other leading suppliers to the protective coatings industry including Kentucky Color and Chemicals Company, Allied Asphalt and Minerals Corporation, Metals Disintegrating Company, Inc., Gillespie-Rogers-Pyatt, Inc., Hy-R-Speed, Inc., Velsicol Corporation, Dorward & Sons Company, J. Lee Smith and Company, and Metalead Products Corporation.

Dale I. Dodds, former head chemist for one of the larger Los Angeles paint manufacturers, assists Mr. Taylor in serving the trade.

• Enlarged Dyestuffs Laboratory

An enlarged Dyestuffs Application Laboratory will be completed in Cincinnati in the near future by Hilton-Davis, according to Nelson S. Knaggs, vice-president in charge of sales. Standardizations of the dyestuffs line manufactured by the company are tested and controlled in the laboratory, under the direction of Richard Van Vyven.

Assisting in setting up additional laboratory equipment is George Nickles, a dyestuffs specialist, formerly of Charlotte, N. C., who has become associated with the company as technical salesman in the textile division.

• American Cyanamid Announces

The new Product Development Department of American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y., announces that Beta-Chloropropionitrile is now being offered in trial-lot quantities. The reactivity of this material, due to an active halogen and a nitrile group, is claimed to cause it to result in numerous potentially useful chemicals.

Beta-Chloropropionitrile is said to be slightly soluble in water, very soluble in most organic solvents, and to have a boiling point of 174-176°C. at 752 mm. Hg.

A bulletin is available which gives extensive data on this chemical. Either the bulletin or research samples can be obtained upon written request to the New Product Development Department, American Cyanamid Company.

• Dr. Stevens Joins Sales Department

Dr. Chapin E. Stevens has recently joined General Aniline and Film's Central Sales Development Department at Easton, Pennsylvania to develop markets for that company's new surface-active agents. Previous to taking his new position, Dr. Stevens was engaged in research on surface-active agents for six years at General Aniline's Central Research Laboratory also at Easton.

• Instrument Course

The Fischer & Porter Company, East County Line Road, Hatboro, Pa., announces a number of vacancies for its next instrumentation course to be held at the Hatboro, Penna. plant, October 10 through 14, 1949.

The course will cover manufacture, calibration, installation, operation and maintenance of the Company's complete line of "flowrator" primary and secondary process control instruments. (Some time is also devoted to the basic principles of variable-area flow measurement.) It is designed for engineers responsible for process control instrumentation and for instrument specifications, installation, operation and maintenance.

Some guest accomodations in the town of Hatboro are available by pre-arrangement and there are frequent trains to Philadelphia, about 18 miles away. Further details can be obtained by writing to the Fischer & Porter Company.

• Non-Ink-Throwing Pen Developed

A solenoid-actuated pen which avoids ink-throwing while providing speedy recording has been developed for use on circular chart electronic potentiometers by Brown Instruments division of Minneapolis-Honeywell Regulator Company.

The new operation pen, in field test for several months, makes use of an amplifying linkage designed so that the solenoid's high velocity reaction is said to be almost spent before the pen is picked up and moved. The pen is a V-type and is claimed to hold a five-day supply of recording ink.

The new device, now available, is said by Brown engineers to be essential for thermal limit recording in continuous pasteurizing processes, for temperature measurements on tire presses or rubber curing and plastic molding, and for many other applications.

• Eisen Joins Bjorksten

John B. Eisen, formerly Group Leader with the Chemical Research Laboratories of American Viscose Corporation at Marcus Hook, Pa., and connected with that organization for ten years, has now joined the staff of the Bjorksten Research Laboratories as Section Leader at their Madison, Wisconsin, laboratories. Mr. Eisen received his A. B. degree at Grinnell College and his Sc. M. at Brown University.

Miniature Contour Projector

• Miniature Contour Projector

The Stocker & Yale Miniature Contour Projector is an optical instrument designed to provide industry with the advantages of a shape best suited for general application, it is said. Its small size is said to make it ideally suited for bench and belt inspection operations. The overall construction has been kept as simple and direct as possible so that modifications of the standard unit for special purposes can be made with a minimum of expense and inconvenience, it is stated.

The principle of operation is quite similar to other projection systems optically but the introduction of a totally enclosed screen is claimed of tremendous advantage. This feature is said to allow the unit to be used anywhere and at any time without interference from surrounding lighting conditions.

Standard magnifications are 120, 90, 60, 45, and 30. Values above, below and in between the standards are available but special. The standard screen size is 6" square and the field of coverage at any magnification may be calculated by dividing magnification value into 6".

The standard Stocker & Yale Projector is equipped with one blank opaque screen, light source and lamp house, complete optical system for one standard magnification, and operates on 115 volts 60 cycles A.C. Other power ratings are available. Standard staging fixtures and gaging fixtures for specific duty are extra.

• New Metalab Catalog

Metalab Equipment Corp. of 1529 Dean St., Brooklyn 13, N. Y. announces that a new, comprehensive Catalog of Metalab Laboratory Equipment is now available. Fully illustrated, this handy reference book is said to contain extensive information on the Metalab line of Sectional Units, Center Tables, Wall Tables, Fume Hoods, Storage Cabinets and Cases, Combination and Interchangeable Units, Specialized Industrial Equipment and many other laboratory items. Also included is a valuable section on practical laboratory planning and the solution of layout problems.

This catalog is said to be of practical value to laboratory supervisors, chemical research engineers, chemists and others interested in laboratory equipment.

For further information, write to Metalab Equipment Corp.

• Foreign Representatives Visit E. F. Houghton & Co.

Two foreign representatives for E. F. Houghton & Co., visited the home plant in Philadelphia last month. Horace Paykel, Managing Director of Paykel Brothers Ltd.. of Auckland, New Zealand, and Victor Paykel, Director of Paykel Brothers (Aust) Pty Ltd., Melbourne, Australia, made the trip to study the latest developments in new Houghton products and manufacturing techniques.

Both Paykel Brothers organizations have represented Houghton as distributors in Australia and New Zealand for 29 years, and since 1937 have been manufacturing under Houghton license and formulae specifications.

The industrialists will continue their survey of Houghton's and other plants in England and the Continent. After this they will return via the Mediterranean, the Suez Canal and down the coast of Africa on their route home.

• Bulletin on Traveling-Oven Recording Thermometer

A new bulletin on the company's Traveling-Oven Recording Thermometer has just been published by The Bristol Company, Waterbury 91, Conn. The bulletin describes the use of the instrument with various types of conveyor ovens to record finishing, lacquering, japanning, drying and baking temperatures. Illustrated with photographs and reproductions of typical chart records, the new bulletin, No. T842, also contains complete specifications and prices. Copies are available from the Bristol Company.

• Perlman Course Opens Sept. 28

The fourth annual session of the Perlman basic textile course will begin on Wednesday, September 28, it was announced by A. M. Perlman, president of A. M. Perlman, Inc. The lectures, which will take place in the main auditorium of Willkie Memorial Hall, 20 West 40th St., will be under the supervision of Raymond Brush, vice-president of the Perlman company.

The Perlman textile course covers the basic factors of textiles from yarns to finished goods. It includes a field trip to a dyeing, printing, and finishing plant. The course is open free of charge to all members of the textile and affiliated trades. As in the past, enrollment is on the basis of first come, first served, with preference being given to those on the waiting list from last year. Attendance is limited to 212 persons, in accordance with the fire laws for the Willkie auditorium.

The schedule of courses with their dates follows: Wednesday, September 28 . . . Textile fibers; October 5 . . . Yarns. October 12 . . . Weaving Illustrated by "Facts about Fabrics," a 20-Minute Sound Picture; 19 . . .Flat Fabrics; 26 . . . Crepe Fabrics; November 2 . . . Spun Yarn Fabrics; 9 . . . Theories of Construction; 16 . . . Testing and Identification; 23 . . . Dyeing and Printing; 30 . . . Things to Come in Textiles.

Application for the course should be made to Raymond Brush, vice-president of A. M. Perlman, Inc., 1412 Broadway, New York, N. Y. Notification of acceptance will be made in writing.

• Continuous Preparing and Bleaching Unit

Better workmanship and economy of operation by stream-lining the processing of textile piece goods demand treatment of fabrics in their natural condition without undue tension in length or width and the combining of several operations into one is claimed by the Hinnekens Machine Company, 199-221 Godwin Ave., Paterson 1, N. J.

The Hinnekens Continuous Preparing and Bleaching Unit is said to combine the processes of desizing starch or protein, bleaching, scouring ready for dyeing (including dyeing white) or causticizing (saponifying), bleaching, scouring and dyeing white for printing ground into one continuous operation, allowing control of the reaction of the chemicals employed, and reducing the actual reaction to approximately 30 to 40 seconds. It is claimed practically possible to apply a given amount of caustic to fabric to produce a definitely limited degree of causticization or saponification and decrease or increase it at will.

All fabrics are said to leave the machine in full width, desized, clean, ready for immediate dyeing, properly shrunk and prepared without any undue stretch in length and width. Goods for printing on white ground need not see the dyehoues at all, it is stated. The above unit is said to deliver them in full width to the scutcher and from it directly to the drier. Natural silk fabrics treated on the

unit including a light scouring in soap are being completely degummed within one-fifth of the time of the old method of degumming, it is claimed.

Other claims include the following: The operation of the above unit comprising three to five separate processes (singeing can also be made a part of it) requires only two (in some cases) three easily trained men, the production has over a period of months come up to 40,000 yards per 8-hrs. performance depending mainly on the weight of the fabric treated, merchandise processed on the above unit shows an increased affinity for both dye and print colors (introducing a further factor of economy) the quality of workmanship is superb and the cost of processing is drastically lower as compared with the separate processing necessary heretofore.

The machine is approximately 65'-4" long, with curing unit 28'-8" high. The balance of the machine is 3' high and 8' wide and is said to be able to take care of merchandise up to 66" in greige width. Machine and processing patents are being applied for.

This unit in part can also be used in conjunction with the Hinnekens Loop Boil-off unit, it is stated.

• Organic Chemical Corp. Organized

The Organic Chemical Corporation has been organized for the manufacture and sale of dyestuffs, intermediates and finishing chemicals for the textile trade. Extensive research will progress in the development of vat and azoic type dyestuffs in the near future. Plant and laboratories will be located at Providence, R. I.

The officers of this corporation are as follows: *President,* Samuel Stott; *V. P. and Chief Chemist,* John J. Sandilands; *Treasurer,* John H. Gormley.

It is to be noted these men resigned from the United States Dyestuff Corp. as of August 1, 1949 to become associates of the new corporation.

• U. S. Testing Opens Cotton Fiber Branch

As a result of increased demand on the part of cotton growers, breeders, merchants and spinners for scientific tests to supplement the data now provided by expert cotton classers, arrangements are being made to open a cotton fiber testing and textile testing branch in Memphis, Tennessee, September 1st, 1949, according to an announcmeent by H. M. Block, Vice President, U. S. Testing Company.

Memphis was selected as the logical location for a commercial fiber testing laboratory in view of its importance as a cotton merchandising and growing center. Having this service available in the Memphis area will permit merchants and mills to work together in selecting a proper type cotton for each application.

Facilities will also be provided for conducting tests on finished yarns and fabrics in order to assist mills in evaluating a particular cotton from the opening room through the spinning and weaving operation.

• National Plastics Exposition

The 1950 National Plastics Exposition will be March 28-31 at Chicago's Navy Pier, it was announced by William T. Cruse, executive vice president of the Society of the Plastics Industry (295 Madison Ave., New York 17, N. Y.)

The 1950 showing is expected to attract exhibitors and attendance from throughout commerce and industry. The adaptability and versatility of plastics are said to have made it and its products important in nearly every manufacturing and retail field.

It is anticipated that attendance will again include individual industrialists and official groups from many nations.

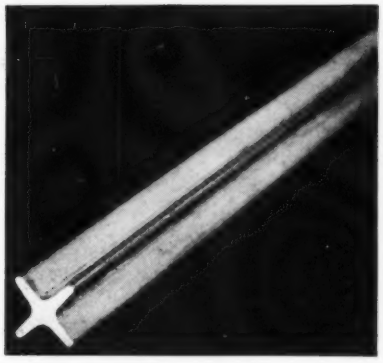
Exhibitors will include those who mold, extrude, laminate and fabricate plastics products; process and fabricate plastic sheeting and film; furnish plastic raw materials; service or supply plastics; and those who make machinery, tools or equipment.

Mr. Dale Amos, general manager of Amos Molded Plastics Company, Edinburg, Indiana, has been named chairman of the exposition committee. He will be assisted by 12 representatives of companies covering all branches of the industry.

• "Karbate" Pipe and Fittings Manual

National Carbon Co., Inc., 30 E. 42nd St., New York 17, N. Y., announces the publication of an Installation Manual for use in connection with its present "Karbate" Brand Pipe and Fittings Booklet, Catalog Section M-8800B. The manual gives detailed information on the installation of "Karbate" pipe, fittings and connections and also on the cements that are used to bond these products. It shows the prospective user how easy it is to fit and assemble "Karbate" pipe and fittings.

A copy of *Catalog Section M-8801,* the installation manual and its companion booklet, *Catalog Section M-8800B,* may be obtained by writing National Carbon Co., Inc.



Armco Steel Shape

• New Shaft Shape

A drawn stainless steel shape has been developed to replace fabricated dye tube spindle shafts, according to Armco Steel Corporation, Middletown, Ohio. This special shape is said not only to simplify manufacture of spindles, but to insure utmost corrosion resistance.

With the drawn stainless steel shape, the only operation required to produce a spindle shaft is cutting the shape to proper length, it is claimed. This is said to replace forming the shaft body by expensive machining or by welding several sections together. Elimination of welding is especially advantageous since warping of welded shafts is said to frequently require a straightening operation.

Because the smooth, continuous surfaces of the drawn spindle shaft permit complete draining, dye cannot become entrapped to corrode the metal and stain the yarn, it is stated. It is further stated that this sometimes occurs in fabricated spindle shafts because the dye is not completely drained from crevices around welds and between the assembled parts.

Other features claimed for the prefabricated stainless steel spindle shafting are rapid flow of dye through the spindle and rigid four-point support of the dye package. It is available in Type 316 Armco Stainless Steel for use in sulfuric acid dye solutions as well as in other grades of stainless for use in less corrosive dyes.

A wide variety of special stainless steel shapes are said to be producible to economically replace machined or fabricated parts of textile equipment.

• Data on Nitrosyl Chloride

A new, 16-page report on the properties and reactions of Nitrosyl Chloride has been released by the Product Development Department of the Solvay Process Division, Allied Chemical & Dye Corporation. The material, taken from a paper presented before the American Chemical Society by T. J. McGonigle of the com-

pany's Department of Nitrogen Research, contains much heretofore unpublished data.

Nitrosyl Chloride—Properties and Reactions, discusses the properties, constants, dissociation values, preparation, equilibrium values plus typical organic and inorganic reactions of this relatively new chemical intermediate.

Copies may be obtained without obligation by writing the Product Development Department, Section P, Solvay Process Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N. Y.

• "Magnetic" Adhesive

H-511 Ubabond, a synthetic rubber cement developed by the Union Bay State Chemical Company of Cambridge, Massachusetts, now is said to make possible the pre-cementing of many materials. Described as "magnetic" in its behaviour, the pre-cemented surfaces can be joined together at a later time, on an assembly line or even after shipping to point of use, without loss of adhesion efficiency, it is stated.

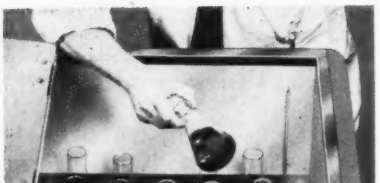
It is stated further that upon application, the adhesive dries to a non-tacky condition after a period of from 15 to 30 minutes at room temperature. Thus, either handling the pre-cemented materials on an assembly line or shipping them for later assembly becomes feasible. Yet, when the pre-cemented surfaces are to be joined together, reactivation can be accomplished easily and quickly be heating the "dead" surfaces under infra-red, steam or dry heat, or by brushing or spraying a solvent on the pre-cemented surfaces, it is claimed.

Said to offer outstanding possibilities for increasing the efficiency and lowering the costs of current cementing operations, as well as for adopting "pre-cementing" in countless new ways, H-511 Ubabond is also claimed to provide an exceptionally strong and permanent bond and will join together or one to the other many materials.

H-511 Ubabond is said to have been widely tested both in laboratories and in industrial use. Amber in color, samples for testing may be secured by writing the Union Bay State Chemical Company, 50 Harvard Street, Cambridge, Massachusetts.

• Refrigerated Bath

Fisher Scientific Company, 717 Forbes St., Pittsburgh 19, Penna., announces a new Refrigerated Bath for laboratory use which is said to obviate the need for makeshift arrangements and use of ice in cooling reaction vessels with their contents. It is



Fisher Refrigerated Bath

claimed to be of particular usefulness in steel or metalurgical laboratories for cooling volumetric test samples, in water and sewage laboratories, and wherever exothermic reactions are under study.

The new Bath is a copper--lined, steel cabinet with tray adjustable by means of supporting chains over height of 10 in. A sensitive thermostat and control provide low temperatures which can be maintained for 15 to 50 gallons of water at any point from 0 deg. C. to room temperature, it is stated.

The 16-gauge copper interior is about 37 in. long by 21 in. wide and 15 in. deep. A cover, hinged at the middle, rests on rubber insulation. The new Bath is for operation on 110 volts, 60 cycle A. C.

• Diamond Alkali Salesmen Advance

Advancement of two key sales executives of Diamond Alkali Company was announced at the company's general headquarters by Fred W. Fraley, vice-president in charge of sales.

Earl J. Mills, manager of less-carload sales for Diamond at its Chicago Sales Office the past two and one-half years, has been appointed as manager of the company's Southwest Sales District, which embraces the states of Texas, Oklahoma and Kansas.

Charles W. Klaus, manager of carload sales at Chicago since 1947, has been named to take complete charge of Diamond sales activities affecting the seven-state area of Illinois, Indiana, Iowa, Michigan, Minnesota, Wisconsin and Nebraska.

Having already assumed their new and enlarged responsibilities, Mr. Mills is headquartered at Houston, Tex., while Mr. Klaus remains at Chicago.

• Fernald New Vice President

Brackett B. Fernald resigned on August 1st as manager of the Chemical Division of the U. S. Oil Company to become Vice President of the newly formed Esmond Chemical Co., Inc., of Esmond, R. I.

Having recently acquired the Esmond Mills property where the most modern equipment is said to be in the process of installation to produce a line of special chemicals for the textile, leather, paper and paint trades, the company is now completely staffing its chemical and physical laboratories.

• Self-Priming Protective Coating

The U. S. Stoneware Co., Akron, Ohio, has announced a new addition to its line of Tygon Protective coatings. The new Tygon Paint Coating, designated as Series "K" is a self-priming vinyl base paint that is said to adhere tightly to metal, wood, or concrete.

Tygon Series "K" self-priming paint is said to have been developed primarily to fill the need for an easily-applied protective coating to resist corrosive conditions not sufficiently severe to warrant the use of the multiple coat series of Tygon Paints.

For normal conditions two to three coats of Tygon Series "K" is claimed to provide effective and long-lasting protection. Series "K" Tygon Paints may be brushed or sprayed; they air-dry quickly or may be baked, it is stated.

It is further stated that Tygon Series "K' shows excellent resistance to corrosive fumes of almost all acids and alkalies; as well as to excessive humidity, grease, oil, and alcohols. It is softened by aromatic hydrocarbons, ketones and esters. Series "K" Tygon Paint is claimed non-oxidizing, non-inflammable when dry, and possessive of an upper temperature limit of approximately 200° F.

The paints are available in black, white, clear, gray, red, green and aluminum.

• New Brookfield Products

The Brookfield Engineering Laboratories, Inc., 004 Porter St., Stoughton, Mass., have stated that the Brookfield Counter-Rotating Mixer makes available in the laboratory mixing speeds and results hitherto only available in large production equipment. They have also announced the availability of an eight-page catalogue describing the Brookfield Synchro-lectric Viscometer covering its method of operation, construction details, outstanding advantages and principles of operation as well as other general details for all models, which are said to be able to measure non-Newtonian as well as Newtonian materials.

The latter is said to offer the fastest and easiest method of measuring the vis-

cosity or flow characteristics of materials both in laboratories and at point of process. It is also claimed to be simple to handle, clean and maintain—being portable to any spot where an electrical outlet is available. Measurements of viscosity are said to be possible in a matter of seconds.

By using two motors driving two concentric oppositely rotating shafts, propeller equipped, the new Brookfield Mixer is said to produce an annular rather than circular flow. Thus, all materials, including the heavier particles, are claimed to be rapidly drawn into the propellers where they must pass through the shearing zone. There is practically no cavitation, no centrifugal effect, and the liquid level remains essentially constant, allowing the use of nearly filled containers, it is stated.

Materials such as Bakelite powder in solvent, which with conventional single impeller or bent rod stirrers require two hours and more for effective diversion, are said to have been thoroughly mixed by the Brookfield Counter-Rotating Mixer in less than ten minutes.

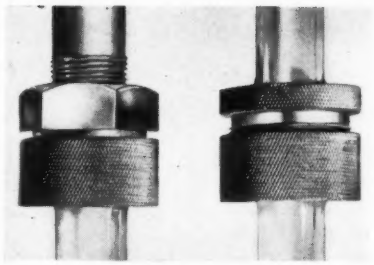
The mixer is said to allow relative speeds from approximately 200 to 12,000 R. P. M. and provide a continuously variable speed control through a general Radio Variac which is mounted, together with an on-off switch, on the support stand base.

The motors are completely enclosed for protection from corrosive fumes and all immersible parts are of type 302 stainless steel, except a bottom guide bearing of leaded bronze. Four high-speed, precision, permanently greased ball bearings provide trouble-free service; and a smooth acting clamp allows quick, easy position adjustments, the company states.

Available for either 110 or 220 volts, A. C. or D. C., and with shaft lengths and propeller designs as required, further information concerning the Brookfield Counter-Rotating Mixer may be secured by writing the Brookfield Engineering Laboratories, Inc., 004 Porter Street, Stoughton, Massachusetts. The bulletin on the Synchro-lectric Viscometer may be obtained at the same address.

• Dr. Lundell Wins ACS Award

The American Chemical Society has chosen Dr. G. E. F. Lundell as the recipient of the $1,000 Fisher Award in Analytical Chemistry for 1949. Dr. Lundell, 80 years old, was chief of the chemistry division of the National Bureau of Standards prior to his retirement. The prize will be awarded Sept. 19 at the 116th national meeting of the A. C. S. at Atlantic City.



F. & P. Coupling

• Improved Glass-pipe Coupling

The Fischer & Porter Company announces a new threaded metal coupling, for use with Pyrex glass pipe lines. The new coupling is said to greatly simplify the installation of glass piping by replacing three-bolt triangular metal flanges. The use of wrenches is no longer necessary and perfect alignment is assured, it is stated. The danger of breakage due to uneven take-up is said to be eliminated. It is further stated that installation time is reduced up to 60 per cent in comparison with alternate methods. Metal couplings are available from stock in sizes ¼", ½", ¾", and 1" for making glass-to-glass or glass-to-metal connections.

• Color Control Program

Installation of a General Electric recording spectrophotometer is said to have given International Printing Ink Division, Interchemical Corporation, an improved method of color control in the Graphic Arts and an accurate method of measuring and analyzing color.

The G-E instrument was installed by IPI to establish a color standardization program in the manufacture of its printing inks and to increase the uniformity of printing in the Graphic Arts. A program of this sort is said to necessitate control of the inks, board composition, and printing procedures.

IPI is using the spectrophotometer in a five point program:

1) Measuring color samples to obtain a pen and ink graph of the color's spectral reflectance—a precise and permanent specification of the color.

2) Obtaining color matches which will appear identical under all lighting conditions.

3) Identifying unknown pigments.

4) Determining cause and correction of color variations on the press. By spectrophotometrically analyzing a sheet to determine color uniformity, it is claimed possible to tell whether or not (a) the over-all color is correct in shade as indicated by the shape of the curves with respect to the standard curve, and (b) the color is uniform over the whole sheet as indicated by the variation or "spread" of the curves. Even under ideal conditions, a certain amount of color variation is said to be inevitable due to the mechanical limitations of presses' ink distribution systems. The ultimate goal of color control is to keep this variation to an irreducible minimum.

5) Correlating the uniformity of printing by different carton manufacturers. By measuring samples of the various plants' production periodically, corrections can be made in the inks or press settings to insure continued color uniformity between plants. Visual working standards which may have changed due to fading and handling are replaced by cartons which follow the OK curve exactly. This procedure is said to eliminate the change of visual color standards over long periods of time.

Knowledge of the spectrophotometric behavior of pigments is said to greatly aid the color matcher in the identification of unknowns and narrow the selection of possible pigments for a given match.

• Cotton-Textile Institute Dissolved

The Board of Directors of the Cotton-Textile Institute, Inc., took affirmative action recently looking to the dissolution of the Cotton-Textile Institute and the formation of a new association to be known as The American Cotton Manufacturers Institute, Inc. The action was conditioned upon similar action taken by the Board of Governors of the American Cotton Manufacturers Association.

The action of the Boards of these two associations does not become final until membership approval of the two associations has been obtained through meetings which will probably be held within the next few weeks.

The replacement of The Cotton-Textile Institute and The American Cotton Manufacturers Association by a single new organization accomplishes the industry unification that has long been sought. Upon its establishment all industrywide problems and activities will be centered within one organization.

In commenting upon this proposed unification, Dr. C. T. Murchison, President of The Cotton-Textile Institute, characterized it as one of the most constructive steps that has ever been undertaken by the cotton manufacturing industry.

• Armour Appointments

H. F. Whitler has recently been appointed Sales Manager of the fatty acid department of the Armour Chemical Division. Mr. Whitler has been employed by Armour and Company for nineteen years having served as Assistant Chief Chemist in Armour's Development Laboratory and as Assistant Sales Manager of the Chemical Division.

Appointed as Assistant Sales Manager to Mr. Whitler was Robert S. Haley. Mr. Haley has been a member of the Chemical Sales Department for nine years.

K. E. Johnson has been appointed Sales Manager of the derivative department of the Chemical Division. Mr. Johnson has been a member of the Armour Organization for thirteen years having worked as Chief Chemist at the New Jersey Plant before coming to the Chicago plant in 1943. H. R. Tennant has been named assistant to Mr. Johnson.

Abstracts

(Concluded from Page 642)

Detergency Studies: IV—Influence of Oily Soil Upon the Removal of Pigment Soil

William P. Utermohlen, Jr., Earl K. Fischer, Mary E. Ryan and Gordon H. Campbell, Textile Research Journal, page 489, Vol. XIX, No. 8, August, 1949.

The authors' abstract follows:

Natural soils on textiles usually contain both oily and solid components, and the generally accepted mechanism of soil removal postulates the emulsification and suspension of oil droplets or of solid particles covered with an intact oil film. Thus the ready removal of solid soil has been considered as dependent upon the presence of an emulsifiable oily soil, which had also served, prior to washing, to bind the solid soil more tightly to the fabric.

Washing tests have been made on cotton soiled to the same extent with lampblack or iron oxide in the presence of an oily liquid binder, of nonoily, water-soluble liquid binders, and of no binder at all. The ease of removal of the pigments was equal or only slightly different in all of these cases, indicating that removal of solid soil and of oily soil are separate phenomena and not interrelated to any great extent. This result indicates the desirability of reconsidering the theory of soil removal, and a possible improvement and simplification of laboratory test methods for detergent value.

Wool and Fur Felt Hat Dyeing

H. J. Hall, The Dyer, page 23, Vol. CII, No. 1, July 15, 1949.

This article first reviews the methods of manufacture of wool and fur felt hat bodies. The best types of Australian merino and Cape wools are generally used as raw materials. Manufacturing consists of blending, opening, carding, hardening and settling. In the hardening operation the mass of loose wool fibers are compressed by the action of mechanical friction, heat and moisture and constitutes the first stage of felting wherein the thickness is reduced from about 3 inches to about one-quarter. In the treatment known as settling, 3 to 5 forms or hoods are soaked in water slightly acidulated with sulfuric acid, wrapped in a rubber cloth, and passed through fluted rollers. This is followed by heavier milling which greatly reduces the size of the form and gives a tight felt. Heavy milling is allowed to continue until the proper-sized hood is reached.

The two important varieties of fur used are rabbit and hare. The pelts are sorted, softened and loose impurities removed. The middle portion requires carroting and after stoving the hair is removed from the skin by a cutting operation. The loose fur is put through the opening machine, then through the blowing machine which removes any impurities, and then blended on a mixing machine. The hat bodies are shaped somewhat differently than the wool felt hat bodies but the subsequent mechanical felting methods are similar.

Both loose wool and loose fur are used in the dyed state to produce mixture effects.

In dyeing wool felt hoods the amount of sulfuric acid remaining must be ascertained. The shade of the dyed felt will decrease somewhat in subsequent processing and it must be dyed slightly heavier than the shade desired in the finished product. Felt hoods should not be allowed to lie about too long after milling as they may become dry in spots leading to dyeing difficulties. Dry hoods require a preliminary treatment in hot water containing a wetting agent for 30 minutes. The following dyeing procedure is given:

"The dyebath is set at 140° F. with 10-20 per cent Glauber's salt and the previously dissolved dyestuffs. Dyeing is usually commenced without acid, or with small amounts of ammonium acetate, which dissociates and slowly releases free acid, but the amount does not exceed 5 per cent. The dyebath is raised slowly to the boil (in 30 minutes) and a gentle boil is maintained for a further 30 minutes before samples are taken and cut to see how penetration has progressed.

"If this is satisfactory and the shade matches the pattern, an addition of from 2-4 per cent sulfuric acid, well diluted, is made to the dyebath, but this is only added when the bath has been fully exhausted and the hoods completely penetrated. The addition of acid is necessary to crack the shellac-borax stiffening emulsion used in the subsequent proofing operation, the shellac then being formed *in situ* in the felt.

When heavy shades are being dyed it may be necessary to start dyeing with a slight addition of acid, but whenever acid is added to the dyebath the amount must be strictly controlled if the proofing process is to be successful."

There is considerable information about the selection of dyestuffs and the application of various classes of dyestuffs. The use of newer types of machinery for hat dyeings has made possible the use of the faster kinds of acid, acid alizarine and Neolan colors which could not be applied by dyeing in the old type of open vat.

The application of acid dyes to fur felt varies little from the method given for wool felts, but the fur requires about twice as much dyestuff. Excess Glauber's salt has a detrimental effect on fur and 15 per cent should be regarded as the maximum. Exhaustion is effected in pale shades by the addition of 5-7 per cent of acetic acid and medium and dark shades by 1 per cent sulfuric acid.

Wool felt hoods may be dyed in machines of the oval paddle type, or overhead paddle type, in which the hoods and the dye liquor are circulated together, or the rotary "Keebush" type machine, in which the hoods are contained in a circular drum which rotates at about 12 r.p.m. through the dye liquor. The Casse hat dyeing machine is suitable for both wool and fur felts. The hoods are kept in motion by a constant movement of the dye liquor which is forced through a perforated false bottom.

Considerable information is given about the F.T.M. "Crescent" machine which may be used for both fur and wool felt. This dyeing system utilizes two flows: a "penetration flow" during which the hoods lie stationary against the perforated plate while the liquor is drawn through the felt and a "re-distribution" flow during which all the hoods circulate freely in the liquor.

Also used a lot for fur felt hoods is the T.B. cone dyeing machine. The hoods are loaded on a perforated cone and dye liquor is forced through the hoods.

• PATENT DIGEST •

PAUL WENGRAF

Acrylonitrile Solution—Reacted on Alkali Prepared Fibers G, 1

U. S. Pat. 2,473,308
(Rohm & Haas, Stallings, June 14, 1949)

Increasing the luster of fabrics by an acrylonitrile-alkali treatment has been claimed in the same inventor's U. S. Pat. 2,390,032 of 1945. This process had the effect of improving the water absorbent properties of the material. It is very surprising to note that by changing the conditions under which these chemicals are applied, just the opposite effect results. The yarns or fabrics become less water absorbent, stronger, stiffer and more resistant to abrasion. The fibrous material is first immersed (preferably under tension) in an aqueous solution of caustic alkali of 10-20% strength at a temperature between 0°-35°C. and thereafter in a solution of acrylonitrile in an inert solvent. The diameter of the yarns increases despite the tension. It can be concluded that the surface of the threads is substantially changed by combining with one or more cyano-ethyl groups ($C_2H_4.CN$—). The yarns or fabrics treated thusly are found to contain more or less nitrogen and to acquire thereby greater or lesser affinity to acid wool dyes. The specification indicates that the chemical change of the newly formed fibrous material can be determined by its behavior to liquid ammonia. With an N-content up to 6%, ammonia does not attack the fibers; at 9% there is some attack, but the fibers do not yet dissolve; at an N-content over 10% liquid ammonia acts as a solvent. It is preferable to introduce 0.3-2.0 cyano-ethyl groups per glucose unit to obtain the effect desired. An example called for impregnating a cotton fabric with 15% caustic soda, squeezing to remove the excess solution and immersing the cloth in a 10% solution of acrylonitrile in Stoddard solvent for sixteen hours. It is washed thereupon, soured, rinsed again and dried at 220°F. The goods showed increased thickness, tensile strength and abrasion resistance, decreased elongation at break, less moisture regain and an N-content of 9.3% corresponding to 1.7 nitrile groups per glucose unit. It must be stated moreover that the material proved to be rot resistant in a standard soil burial test.

References cited by the Patent Office, among others:

U. S. Pat. 2,390,032 (Rohm & Haas, Stallings) claims an increased water receptivity effect by a combined alkali-acrylonitrile treatment under other conditions.

U. S. Pat. 2,233,475 (Dreyfus) suggests reacting alkali cellulose with chloro-acetonitrile to increase the affinity of the filaments to acid dyestuffs.

Other reference: U. S. Pat. 2,011,227 (DuPont) recommends the treatment of viscose with a compound containing the —CN— anion, to render it less sensitive to the influence of temperature.

Delustering—Finely Dispersed Titanium Dioxide F, 3, 01

U. S. Pat. 2,464,192
(American Cyanamid, Whateley, March 8, 1949)

The present invention may be interesting in that fine titanium dioxide can be prepared by a special method. It is known that TiO_2 is used largely for delustering or in pigment printing technique. Ordinarily the product is precipitated in form of the hydroxide (from the sulfate solution) and calcinated. The pigment flocculated from aqueous dispersions has the drawback of being difficult to redisperse. This property is due to a certain amount of flocculent retained in the particles, although a pigment flocculated with $MgSO_4$ containing only 0.14% of the salt is poorly dispersible in water. It has been observed that very small amounts of alkaline salts (not more than 2%, calculated from the pigment) added to the pigment slurry in water, can give a very fine flocculation with sodium sulfate, provided the solutions have a pH value over 6.4 (Chlorophenol Red as indicator). It is believed that the dispersibility of titanium dioxide in water is due to the negative charge of the particles while the acid reacting magnesium sulfate has the effect of immediate flocculation.

No references are cited here by the Patent Office.

The invention may be of some interest because of the frequent use of TiO_2 in delustering and generally in pigment printing operations.

Starch Sizes—Alkali Stannate Added A, 4, 01

U. S. Pat. 2,468,207
(Corn Products Refining Co., Kerr, April 26, 1949)

Starch pastes, obtained from native starch, are relatively unstable. The viscosity is said to increase first until a maximum value is reached but continued agitation decreases the viscosity again as well as the presence of acids or alkalis does. A method has been found to obtain colloidally stable starch pastes which are easily dispersible in water. The invention consists of adding small amounts of sodium stannate ($Na_2SnO_3.3H_2O$) or potassium stannate ($K_2SnO_3.3H_2O$). A paste, prepared this way, is quite transparent and maintains a high level of viscosity despite agitation or addition of electrolytes. The amount of potassium or sodium stannate necessary to bring about this reaction is about 5.0% and not more than 10%, calculated on the weight of the starch. The superiority of the new product is said to be proven by two specific tests used for evaluating the viscosity of starch pastes: the Scott, and the Stormer, both of which are fully described in the specification. Not only all kinds of raw starches but also waxy starch and dextrine are favorably influenced by adding stannate solutions.

References cited by the Patent Office, among others:

U. S. Pat. 2,399,986/1946 (Standard Oil): gelatinized starch is added to drilling muds.

U. S. Patent 2,386,509/1945 (Corn Products Refining Co.): starch is modified by heating with lower alcohols.

U. S. Pat. 2,280,998/1942 (Aluminum Company of America): starch is used in alkaline media in metallurgic processes.

Scouring Caustic Impregnated Cellulosic Textiles—Steam After Treatment B, 1

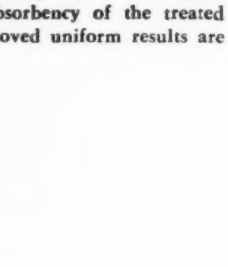
U. S. Pat. 2,469,249
(Mathieson Chemical Corp., Vincent—Dubeau, May 3, 1949)

Several processes have been suggested in recent times, comprising an impregnation of raw textiles (greige cloth) with caustic alkalis, followed by a steam treatment. The present specification claims that these former methods did not prove fully satisfactory because of a generally irregular absorbency of the treated material. Improved uniform results are said to be obtained however by maintaining the temperature of the cloth during its passage from the steambox to the washing machine at or above 140°F. (preferably 160-180°F.) and by carrying out the washing operation with hot water instead of a cold rinsing process. It is believed that some of the impurities such as proteins, adhering to the raw, nonscoured material, are solubilized by the simultaneous action of heat and caustic, but that these compounds are reprecipitated on the fibers by a sudden drop of the steam temperature (200-212°F.) to that of the washing liquid which is usually kept at room temperature. By carrying out the scouring process as described above good, uniform wet ability is obtained in a single steaming operation without repeating scouring. It should be noted that the invention can also be applied in conjunction with bleaching processes by treating (for instance, a cotton greige broadcloth) with caustic soda, sodium chlorite and a synthetic detergent such as Ocenol sulfate. The material is impregnated with this solution at about 125°F., subjected to one-half hour steaming at 210-212°F. and passed to the washing machine through a conduit which is heated to 180°F. Heating of the water contained in the washing machine is also recommended.

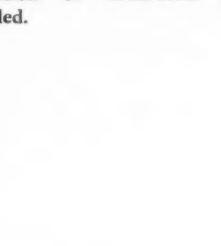
References cited by the Patent Office:
U. S. Pat. 2,391,905 (Buffalo Electro-Chemical Co.) covers the well-known method of textile bleaching or otherwise processing by leading the goods in an alkali-impregnated condition down a J-box and subjecting the material in this phase to a steam treatment.

Reference is made to U. S. Pat. 2,433,370 (same company) abstracted in REPORTER, 432 (1948).

The characteristic feature of the present process is that all operations are carried out under almost the same temperature so that undesired flocculation and reprecipitation of solubilized particles is avoided.



Book Reviews



Edmund Potter and Dinting Vale

By J. G. Hurst. Published by Edmund Potter & Co., Ltd., Manchester, England, 1948. 120 pages.

This little book is primarily an intimate biography of one of England's industrial giants of the 19th century, but it is indirectly a history of an important period in British industrial life.

Edmund Potter, with his brother, Charles, started a small print works at Dinting Vale in Derbyshire in 1825. In those early days printing was carried on by a combination of hand-blocks and machines. Dyes were relatively few and confined to the natural coloring matters. The printing trade was severely handicapped by a tax of five shillings and threepence on each printed piece, which was not abolished until 1831. Potter's plant had a struggle for existence and the company failed in 1831, but was reorganized under the name of Edmund Potter & Co., and succeeded in liquidating all its indebtedness within five years. With the repeal of the Print Tax, and by the elimination of block printing, the company prospered, and by 1851 it was operating 24 printing machines, which had been increased to 51 at the time of Mr. Potter's death in 1883, making it the largest print works in the world.

In addition to his activities as a manufacturer, Mr. Potter was a leader in Manchester's commercial life, interested in education, and prominent in the fight for Parliamentary reforms. He served as a member of Parliament from 1861 to 1875.

The book is interestingly written and very well printed.—W. H. C.

THE DYEING OF WOOL-NYLON BLENDS*

G. T. HUG

THE coloration of wool-nylon blends presents problems to the dyer even greater than those heretofore encountered with admixtures of wool and other fibers. Not only do both fibers have affinity for the same types of colors, but this affinity is not one of constant proportions on the nylon component. In very pale shades, for example, nylon will absorb more color from the dyebath than wool. In many cases the wool is not even dyed, a fact which has caused considerable difficulty in the production of pale blue shades. As the strength of the dyeing is increased a point is often reached where both wool and nylon are equally dyed but from then on it is the wool which is preferentially colored.

Then, too, the dyer must contend with the well-known blocking effect; where, on nylon, one color of a mixture may be absorbed to the total exclusion of the other.

The use of nylon in admixture with wool has been constantly increasing—as filament yarn in hosiery to impart added strength at points of wear or as cut staple in piece goods. Both types of nylon have different characteristics as far as the dyer is concerned, the cut staple having somewhat better receptivity for the dyestuff. Delustered nylon dyes weaker than the bright material and each blend creates almost an individual problem. For this reason it is not possible to make specific dyestuff recommendation. A color which performs well on one blend may give totally unsatisfactory results on another.

If a good union is to be obtained on wool-nylon blends it is essential that the nylon be dyed slightly deeper in tone than the wool as its natural luster tends to impart the impression of tinctorial weakness. This is, of course, particularly true of bright filament yarn. As stated before, good unions are often rather difficult to accomplish, greater affinity of nylon for color in pale shades and lower affinity or blocking in heavy shades calling for much ingenuity on the part of the dyer. Color selection becomes very important, as does a knowledge of dyestuffs, their affinity for the two components in the blend and their compatibility in mixtures.

In considering classes of dyestuffs suitable for dyeing wool-nylon blends, it becomes necessary to select colors from the neutral dyeing acid, level dyeing acid, chrome and "Chromacyl" groups. Acetate colors, which are used extensively for dyeing nylon alone, cannot be used due to their attachment for wool and their poor fastness properties on the latter fiber.

Our experience has indicated that the best results can be obtained with the neutral dyeing acid colors. The DuPont Milling dyes, and "Pontacyl" fast Blue 5R Conc. and "Pontacyl" Wool Blue GL Conc. 200%, are representative of this group. On wool-nylon blends these types generally exhibit good wet fastness properties and when carefully selected they produce satisfactory light fastness, particularly in the deeper shades.

The union obtained will depend largely upon the type of nylon used in the blend. It has been pointed out, that variations in results can be expected when using filament yarns in one case or cut staple in another. As in other types of union fabrics, good blending is of great importance. A poor blend can readily give an impression of unlevelness.

When using neutral dyeing acid colors, the dyebath is set with 5 to 10% of ammonium acetate and about 10% of Glauber's salt. Starting cold, the temperature is slowly raised to 200°-212°F. and dyeing continued for an hour and a half. If necessary, the bath can be exhausted by the very careful addition of small amounts of acetic acid.

As wool-nylon blends generally contain a larger proportion of wool, considerable care must be used in applying the neutral dyeing acid colors. If the dyeings are started with acid and brought rapidly to the boil, the nylon will absorb much less color than the wool and a poor union will result. The difficulty in obtaining level dyeings on the wool when following such a procedure need hardly be stressed.

Level dyeing acid colors can be used for pale to medium shades for women's dresswear. Representative colors include such dyes as "Pontacyl" Carmine 2B and several of the DuPont Anthraquinone blues. They can be applied with 5 to 10% of an organic acid, such as formic or acetic and about 10% of Glauber's salt. Mineral acids, such as sulfuric acid, while commonly used for wool piece goods dyeing, should be avoided due to their tendency to degrade the nylon.

Level dyeing acid colors have to be chosen with great care as many of them exert the familiar blocking effect when used in mixtures. Every combination should be evaluated in the laboratory before any attempt is made to dye a batch of cloth.

The saturation point of these colors on nylon is also quite low and it is therefore not possible to obtain heavy shades. For navy and black, neutral dyeing acid colors would be required.

From the standpoint of levelness the level dyeing acid colors would naturally be preferred. In very pale shades, however, they transfer readily from the wool to the nylon and thereby have a tendency to dye the latter fiber deeper in shade.

Chrome colors possess the best all-round fastness properties on both wool and nylon. When dyed on a multi-fiber weave, the wool is often dyed heavier than the nylon, which limits the range of suitable colors. Many colors also require larger amounts of bichromate to effect lake formation on nylon than on wool. By following normal wool-chroming methods the color on the nylon component often remains unchromed. If, on the other hand, the amount of bichromate is increased, the color on the wool is generally overchromed and the careful selection of dyestuffs again becomes an important factor. Pleasing shades of brown can be produced with DuPont Chromate Brown EBN.

* Presented at the Wilmington Conference of Nylon Dyers and Finishers, sponsored by E. I. du Pont de Nemours & Co., Inc.

Where relatively large amounts of nylon are present in a blend, it has been found that this fiber absorbs a considerable quantity of bichromate. If this is left in the fiber, the shade will be duller and the fastness to light is sometimes seriously affected. It is therefore advisable to subject the completed dyeing to a 10 or 15 minute treatment with water at the boil, which removes the residual bichromate.

"Chromacyl" colors are, as a rule, not satisfactory for producing solid effects on wool-nylon blends unless the material has been carbonized. The residual acid in the fabric is then utilized during dyeing and good penetration, color development and balance between the two fibers can be obtained.

Carbonization of wool-nylon blends is not generally recommended as the sulfuric acid causes degradation of the nylon component, which continues during storage.

The effect of long-chain alcohol sulfates, which include such products as "Duponol" D Paste and "Avitex" AD, may be of potential interest in the dyeing of wool-nylon blends, particularly for the pale shades. It appears to be possible to control the degree of color absorption by the nylon, at least to some extent, by adding one of these products to the dyebath.

It is assumed that these long-chain alcohol sulfates have preferential affinity for nylon, using up some of the available dye sites and preventing an excess of color from being absorbed.

As an example, a 0.1% dyeing of "Pontacyl" Light Red 4BL Conc. 175% on a 50/50 wool-nylon blend normally dyes the nylon and leaves the wool only slightly tinted. By adding 2% of "Duponol" D Paste to the dyebath, however, the wool is dyed heavier than the nylon. It becomes clear that by careful adjustment of the "Duponol", a good union between the two fibers can be obtained.

This method is only effective in those cases where the dye has preferential affinity for the nylon. Where preferential affinity for wool exists, the nylon is dyed very much lighter when 2% "Duponol" D Paste is added to the dyebath. One example of a dye possessing this characteristic is "Pontachrome" Flavine A, a chrome color, which will leave nylon white under these conditions.

It is also possible to obtain a similar effect by pre-treating the material, prior to dyeing, with "Duponol" D Paste and a small quantity of acetic acid. It has not yet been determined whether these "partial resists" (if they may be so-called) obtained by a pretreatment are permanent, or if this effect is lost if the treated material is rinsed out thoroughly in water. However, it does point out the need for care in the scouring of wool-nylon blends before dyeing.

If one batch of cloth were to be scoured with a synthetic detergent, the other with soap and ammonia, it would probably not be possible to use the identical dye formula for both batches. In one case the nylon would be dyed lighter than in the other and a good union may not be obtained. By the same token various quantities of synthetic detergent from one batch to another would probably give different end results.

The effect of a long-chain alcohol sulfate appears to be more pronounced with the level dyeing acid colors than with the neutral dyeing types. This effect will be illustrated with a few slides at the conclusion of this paper.

For many types of fabrics it may be desirable to dye only the wool, leaving the nylon uncolored. At the present time a few isolated dyes will leave nylon white, particularly when applied in conjunction with a long-chain alcohol sulfate, but a complete range is not available. It therefore becomes necessary to resist the nylon, either in the form of cut staple prior to spinning or in the form of yarn prior to weaving.

Resisting is carried out by treatment with tannic acid, tartar emetic and stannous chloride. The process is similar to the old silk resisting method but where separate baths were generally used for silk, only a single bath is necessary for nylon.

The resisting bath is first set with 0.2 ounce per gallon of acetic acid (28%) and 0.025 ounce per gallon of tetrasodium pyrophosphate to sequester any dissolved iron which could cause objectionable staining and dulling of the nylon. This bath is allowed to stand for 10 to 15 minutes at room temperature. At the end of this time 5% of tannic acid and 3% of acetic acid (28%) are added, whereupon the material is entered. The temperature is raised slowly to 200°F. After treating for 30 minutes, 5% of tartar emetic is added. This is followed by treating for 20 minutes, and the addition of 2% of stannous chloride. After another 10 minutes the material is rinsed and dried.

Acid colors, which normally do not stain resisted silk, leave nylon white or stain it very slightly. This includes the majority of the "Chromacyl" colors. Chrome colors generally impart a slight stain or dull the resisted nylon, at least in medium to heavy shades. In many cases this may not be too objectionable in a blended fabric, particularly if the percentage of nylon is not too high.

Summary

For the dyeing of wool-nylon blends neutral dyeing acid colors will produce the best unions with generally good fastness properties. Level dyeing acid colors can be used for pale to medium bright shades but great care must be used in their selection to avoid any blocking effect.

Chrome colors offer the best fastness; the choice of colors is limited, however, due to difficulties in chroming on the nylon component. "Chromacyl" colors are recommended for the dyeing of carbonized materials.

The affinity of nylon for all types of acid colors can be substantially decreased by the addition of a long-chain alcohol sulfate to the dyebath. Indications point to the fact that such compounds should not be indiscriminately used for scouring.

Nylon-white effects are best obtained by resisting the nylon either in the form of cut staple or yarn before spinning and weaving. The tannic acid, tartar emetic, stannous chloride treated yarn will remain undyed by most level dyeing acid and "Chromacyl" colors, but will be stained a trace to considerably by many chrome colors.

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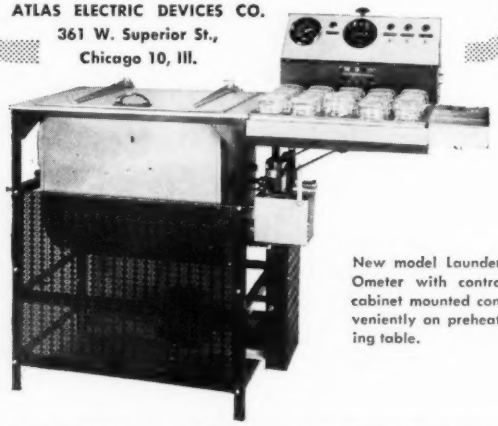

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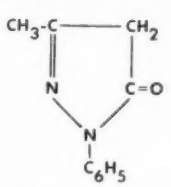

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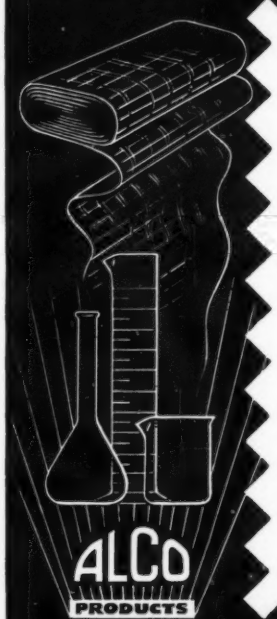

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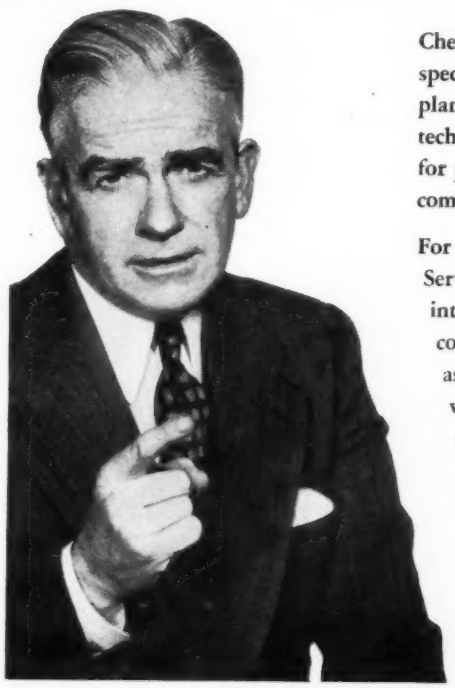

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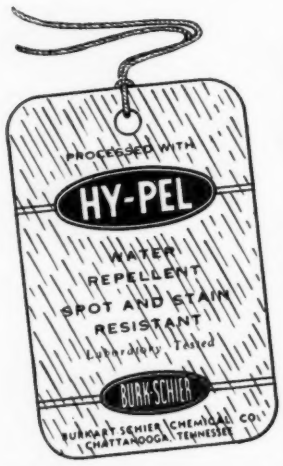

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INDEX TO ADVERTISERS

Aktivin Div., The (Heyden Chemical Corp.) VIII
Alco Oil & Chemical Corp. XXXIII
Althouse Chemical Co., Inc. ..... Second Cover
Amalgamated Chemical Corp. .....
American Aniline Products, Inc. III
American Cyanamid Co. ..... Back Cover
American Dyewood Company .....
Arkansas Company, Inc. IV
Armour & Co. XXX
Arnold, Hoffman & Co., Inc. .....
Atlantic Chemical Co., Inc. .....
Atlantic Refining Company, The IX
Atlas Electric Devices Co. XXX

Barry Chemical Co. .....
Becco Sales Corp. XXX
Bick & Co., Inc. .....
Blickman, Inc., S. .....
Burkart-Schier Chemical Co. XXXVI
Butterworth Sons Co., H. W. .....
Calco Chemical Division, American Cyanamid Co. XXIX
Calgon, Inc. .....
Campbell & Co., Inc., John .....
Carbic Color & Chemical Co., Inc. XXVI
Carbide & Carbon Chemicals Corp. .....
Chem-Col Co., Inc. .....
Ciba Company, Inc. .....
Colgate-Palmolive-Peet Company .....
Commonwealth Color & Chemical Co. XXXI
Crucible Steel Company of America XIX

Drew & Co., Inc., E. F. .....
Du Pont de Nemours & Co., E. I. .....
Ammonia Dept. .....
Dyestuffs Division ..... Front Cover
Electrochemicals Dept. .....
Fine Chemicals Division V

Emery Industries .....

Fancourt & Co., W. F. XII

Geigy Company, Inc. .....
General Chemical Division, Allied Chemical & Dye Corp. .....
General Dyestuff Corp. .....
Girdler Corp., The .....
Glycerine Producers' Association .....
Grinnell Co., Inc. .....
Gross & Co., A. XXII
Gurley, W. & L. E. .....

Hardesty Co., W. C. .....
Hart Products Corp. .....
Hefti & Co., M. X
Hercules Powder Co. .....
Heyden Chemical Corp. .....
Hinnekens Machine Company .....
Hooker Electrochemical Co. XVI
Houghton & Co., E. F. XXI

Interchemical Corp., Textile Colors Div. ..... XIII, XIV
International Nickel Co., Inc. .....
International Salt Co., Inc. .....

Kali Mfg. Co. XXXV
Kearny Manufacturing Company, Inc. .....
Kelco Co. XVII
Koppers Co., Inc. .....
Laurel Soap Mfg. Co., Inc. .....
Leatex Chemical Co. XXXI
Leeds & Northrup Co. .....

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● INDEX TO ADVERTISERS ●

Manhattan Storage & Warehouse Co.
Mathieson Chemical Corp.
May Inc., Otto B.
Maywood Chemical Works
Metalsmiths Div., Orange Roller Bearing Co., Inc. XXXVIII
Monsanto Chemical Co. XXIV, XXV

National Starch Products
National Aniline Division, Allied Chemical & Dye Corp. XXVIII
National Milling & Chemical Co. XXXV
Nopco Chemical Co.
Nova Chemical Corp.
Nuodex Products Co., Inc. XXXIII
Nyanza Color & Chemical Co., Inc. XX

Onyx Oil & Chemical Co. XI

Pabst Sales Company
Perkins & Sons, Inc., B. F.
Pfizer Co., Inc., Chas.
Philadelphia Quartz Company
Pittsburgh Plate Glass Co.
Procter & Gamble XXXVII
Prufcoat Laboratories, Inc.

Refined Products Corp. XXIII
Richmond Oil Soap & Chemical Co., Inc. XXXIII
Rodney Hunt Machine Co.
Rohm & Haas Company
Rona & Co., Inc., L. L.
Royce Chemical Co.
Rumford Chemical Works

Sandoz Chemical Works, Inc.
Scholler Bros., Inc.
Sharples Chemicals, Inc. XXXIX
Sindar Corp.
Socony-Vacuum Oil Co., Inc.
Solvay Sales Div., Allied Chemical & Dye Corp. XXXV
Standard Brands, Inc. VII
Standard Chemical Products, Inc. Third Cover
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